

A STATEWIDE PLAN FOR MEDICAL EDUCATION IN NORTH CAROLINA

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to the Board of Governors of the
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Report of the Panel of Medical Consultants
to the Board of Governors of the
University of North Carolina

September, 1973

"The health of the people is really the foundation upon which all their happiness and all their powers as a state depend."

--Disreali

"The curative value of medicine has been so overemphasized that the public has come to equate health with access to physicians. When access is provided and physicians fail to deliver the health improvements demanded by millions, it is not the limitations of medicine that are blamed, but the particular physician or the medical establishment. There is disappointment and bitterness, and expressed politically."

Medical Cure and Medical Care
The Milbank Memorial Fund
Quarterly, Vol. L, No. 4,
Part 2, Oct., 1972, p. 7

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Acknowledgement

The members of the Panel wish to express their grateful appreciation to the many individuals in the State of North Carolina without whose cooperation this study would never have been completed.

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I. INTRODUCTION

A. Background.

In June, 1972, East Carolina University (ECU) asked the Board of Governors of the University of North Carolina (UNC) for budgetary support during 1973-75 to add a second year of medical education to its new one-year medical program which was scheduled to begin with the admission of 20 students in September of 1972. This request was described by ECU as:

" . . . the logical next step toward the eventual establishment of a degree-granting medical school at East Carolina University."

The objectives of the proposed expansion to a two-year program were listed as:

1. To provide greater access to more North Carolina students to enter medical school.
2. To permit the establishment of a traditionally and nationally recognized first step in new medical school development leading toward the eventual establishment of a degree-granting school of medicine.
3. To greatly increase the number of students enrolled in the East Carolina University School of Medicine to permit much more economical and efficient use of currently available teaching

facilities and to greatly reduce the annual cost to the State per medical student enrolled.

4. To vastly expand the community services from the medical school to the state and, especially, to the severely physician deprived eastern region.
5. To permit the School of Medicine to attain the necessary state of operation required to become eligible for federal funds in the Health Professions Educational Assistance Act as well as funds from various foundations that traditionally support developing new schools but have no interest in one-year programs.
6. To return to the School of Medicine at the University of North Carolina the right and the necessary flexibility required to implement enrollment increases and curriculum changes in its first-year classes which the current cooperative one-year program prevent (sic).

For the newly-established Board of Governors, this request from ECU raised broad questions about the future role of the state's system of higher education in meeting the health needs of the citizens of North Carolina. At the suggestion of President William Friday, Governor Robert W. Scott, in his capacity as Chairman of the Board of Governors, appointed a Special Committee of the Board to examine the ECU request and related matters in medical education.

B. Report of the Special Committee of the Board
of Governors, December 29, 1972.

The members of the Committee appointed by
Governor Scott were:

Mr. Robert B. Jordan, III, Chairman

Dr. Andrew A. Best

Mr. William A. Johnson

Mr. Reginald McCoy

Mr. William B. Rankin

The charge to the Committee from Governor
Scott was:

"You are requested to give your judgment
and recommendation regarding this
specific request to the Board of
Governors when you are ready to do so.
In reaching your recommendation, you
are authorized to inquire into and
examine those aspects and programs of
medical education you may deem related
to the specific question before you."

The Special Committee consulted widely within
the state and nationally on "the full range of
problems pertaining to the present state of medical
education and health care delivery in North
Carolina, and future needs of the State in these
areas."

Its report to the Board recommended:

- State support for expanded enrollment of N.C. students in the Bowman Gray and Duke University Schools of Medicine:
- Expansion of enrollment in the School of Medicine of the University of North Carolina at Chapel Hill (UNCCH);
- Continued support of the Southern Regional Education Board (SREB) program providing spaces for N.C. students at Meharry Medical College.
- Certain organizational changes of the Board of Governors and the General Administration Staff of the University to facilitate the implementation of health science education programs and to provide a continuing overview of these programs on all campuses of the University.

Each of these recommendations will be mentioned and discussed at appropriate places in this report.

In addition, the Special Committee was of the opinion that further serious consideration should be given to "the establishment of a new, degree-granting school of medicine which would emphasize the training of primary care physicians," and called for a study by a panel of medical consultants to the Board of Governors. This recommendation led directly to the appointment of this Panel and to this report.

Because the Special Committee felt that our study and recommendations should be available to the Board of Governors before any decision to commit state tax resources to build a second school of medicine, the specific ECU request for 1973-75 funding of a two-year medical education program was recommended for disapproval.

C. The Charge to This Panel.

After discussion with Mr. William Dees, Chairman of the Board of Governors, President William Friday, and the aforementioned members of the Special Committee on April 13, 1972, we accepted as our charge the instructions embodied in the original recommendations of the Special Committee:

"Accordingly, we recommend that the Board of Governors commission the appointment of a team of experienced and qualified national consultants to evaluate the need for an additional degree-granting school of medicine within the University of North Carolina. It is further recommended that in their study the consultants be directed to examine all possible institutional alternatives, including, specifically, the present medical education program at East Carolina University, for the provision of additional doctors to all regions of the state."

From the outset, we have taken the view that an increase in the number of practicing physicians and an improvement in the distribution of physicians are both desirable and necessary if there is to be substantial, long-range improvement in North Carolina's ability to meet the needs and demands for medical care by its citizens. We emphasize, however, that efforts directed toward expansion of the number of physicians, while necessary, will not be sufficient to meet the needs and demands of the public.

Continuing attention, emphasis, and support will be required on a wide front, encompassing inter alia:

- Establishment of primary care clinics;
- Incentives to group and rural practice;
- Increasing physician productivity through the use of ancillary health personnel, including physician's assistants (PAs) and family nurse practitioners (FNPs) as well as the more traditional allied health professionals;
- The assurance of appropriate general and special hospital facilities within reasonable access of all areas of the state;

---The establishment of more programs of post-graduate (internship and residency) and continuing education for physicians and other health professionals to maintain the quality of care and to alleviate professional isolation in rural areas;

---And many other health-related matters such as improved sanitation and water-supplies, better housing, better nutrition, efficient transportation, and continued emphasis upon regional economic development.

Our main effort has been directed to the problems of number and distribution of physicians but, where appropriate, we have not hesitated to set these two problems in context by touching upon these broader issues. More doctors alone is not a panacea for better health in North Carolina or any other state.

Our report and recommendations will do a great service if they succeed only in convincing the reader of the importance of establishing priorities for expenditure of public funds among a wide array of efforts to improve access to medical care and to improve health generally.

D. The Panel's Procedure.

To increase our understanding and to analyze the various components of the physician shortage and related shortcomings in medical care in North

Carolina as well as to develop and "cost out" alternatives, we drew on many sources of information in writing this report and framing our recommendations. These sources are catalogued in Appendices A and B and include:

1. A detailed and systematic review of numerous North Carolina publications and reports concerning vital statistics, health indicators, health care facilities (existing and planned), population projections, health professional education programs (existing and planned), state and regional economic development, transportation, etc.
2. A selective review of experience with similar problems in other states drawn from publications, personal communications, and our own direct experience.
3. A series of hearings and direct consultations with educators, health services administrators, practicing physicians, legislators, local and state officials, nurses, and students.
4. Unsolicited communications from interested North Carolina citizens received directly by us or referred to us by members of the Board

of Governors, members of the legislature, and others who consulted with us.

5. Specific information requested from North Carolina agencies and institutions and certain national organizations and associations. With exceptions so rare that they can only be described as trivial, these requests were answered promptly, particularly those made to organizations in North Carolina. We interpret this responsiveness as indicative of a pervasive concern with the problems addressed by the Panel. There is clearly a large reservoir of willingness on the part of a broad segment of individual citizens, public agencies, and private organizations to work together in implementing programs to alleviate or ameliorate the physician shortage in North Carolina, to make medical care more accessible in all regions of the state, and to improve the health of all North Carolinians.

Despite what seemed to us an extraordinary amount of coverage in news columns, on editorial pages, on radio, and on television devoted to our deliberations and to the ECU proposal for a new

medical school, we adopted and have followed a deliberate policy of holding no press conferences, preparing no releases, and refusing all invitations to comment substantively to the media. This decision was based upon a determination to report our findings, conclusions, and recommendations to the Board of Governors and to leave to the Board the final disposition of our report. We have tried to be open, informative, and frank at every stage with all individuals with whom we have consulted. We have not suggested to them that our discussions should be regarded as confidential or privileged. Past experience in many other settings has taught us that any such stipulations would be both misinterpreted and disregarded. Furthermore, we saw nothing to be gained by attempting to interfere with free exchange on an important public problem between the news media and the many individuals who gave generously of their time in helping us with this endeavor.

E. The Nature of This Report.

The tone and direction of our report and recommendations are such that it seems appropriate

to explain our reaction to the social and political climate in which we conducted our study.

We were not at all surprised at the pervasive public worry and anxiety in North Carolina about the difficulty of obtaining physician services or gaining prompt access to medical care. Throughout the nation, the demand for medical services is exceeding the capacity of the present delivery system(s) to provide care and all state governments are seeking solutions to this complex problem. The expressed concern of the citizens of North Carolina and the evident determination of both the executive and the legislative branches to take effective remedial action are typical of the situation throughout the country.

We were quite surprised, however, to discover that public consideration of possible actions to improve medical care in North Carolina was narrowing, with single-minded intensity into a protracted, often acrimonious, partisan and regional political debate concerning the specific proposition of establishing a new, degree-granting school of medicine at ECU. The result of this sharp focus

brought about by apostolic advocacy for a single possible step has been that several additional alternative and potentially effective measures that deserve careful consideration lately have received scant attention.

This is not to say that the broad aspects of the problem of medical care in North Carolina have never been studied or analyzed. To the contrary, there exist many recent, searching studies and recommendations on this subject and many promising and pioneering programs, with and without state funding, are already well underway, but have received little public attention. With the heated polarization over the ECU proposal at the center of the public stage, however, these alternatives and new programs for the future have tended to be treated with subjective disregard or derogation for purposes of argumentation rather than with objective analysis and evaluation for purposes of implementation. In many of our discussions, we heard hints, conjectures, and even threats that the success or failure of the entire reorganization of the University of North Carolina under the Board

of Governors might depend upon our making the "right" recommendations the the Board's subsequent actions.

Early in our deliberations, we decided that one of our tasks must be an effort to restore balance and perspective to the consideration of the physician shortage in North Carolina. To this end, we have tried to be as objective as possible in reviewing the available factual information and we have been as candid, even blunt, as propriety allows in expressing our opinions. We certainly have not limited our recommendations to measures which, in our judgement or the judgement of many who consulted with us, would be received so rapturously that prompt and favorable action by the Board or the legislature might follow automatically without dissent or further disagreement, discussion, and debate.

In the interest of clarity, and, admittedly, at some risk of oversimplification, the main body of this report omits many details that would have been repetitions from prior studies.

II. SUMMARY AND CONCLUSIONS.

The Health Status of North Carolina (IV)

Ability to make meaningful assessments of the health status of a population group or to compare the health of different populations is very limited because the vital statistics which have been collected through the years record only such gross indicators as infant mortality, number of hospitalizations, and death rates and are not sensitive to changes that occur at levels below these catastrophic life events. The data are not sufficiently detailed, they cannot be applied to action programs on a timely basis, they have no predictive value for public demands on the health care system or for the ability of the system to respond, and they are greatly influenced by social and economic factors other than the availability of medical care.

Health is dependent upon pure water, safe and nutritious food, clean air, and adequate housing. It is determined by customs, habits of eating, exercise, avoidance or use of alcohol and tobacco, and many other individual and group patterns of behavior.

More than 80 per cent of the improvement in life expectancy in the U.S. (and North Carolina) since 1900 had already occurred by 1935 and resulted from improved water supplies, food inspection, indoor plumbing, modern sewage disposal, improved housing, and other technological advances that arose from a far wider range of engineering and professional competence than that of medicine alone.

Modern scientific medicine, aside from the reduction of bacterial diseases as major causes of death which occurred through the use of antibiotics and chemotherapy between 1935 and 1955, has had surprisingly little direct impact upon life expectancy or health status as measured by vital statistics.

Since 1955, the U.S. death rate has run parallel to the baseline with occasional minor fluctuations caused by "excess deaths" in years when outbreaks of influenza have occurred.

Infant mortality is closely correlated with family income, regardless of race and the relationship between low income and deficient health in the U.S. (and North Carolina) is a well-documented fact. It is the generally lower income of non-whites

that accounts for the widespread finding that infant mortality of non-whites is nearly twice that of whites. This "poverty related" statistical gap is closing slowly throughout most of the country and the figures for North Carolina mirror the general experience in the U.S.

A statistic that is an unusually good index of the general health status of an important segment of the population is the rate of rejection for medical reasons of young men called for the military draft. The record of North Carolinians in this respect is outstandingly good.

These health indices, despite their limitations, are the best now available. A comparison of North Carolina with the U.S., the states of the South Atlantic region, other nearby states, and selected states in other parts of the country indicates that past progress in improving the health of North Carolinians and the status achieved to date are quite comparable to and, in certain instances better than, the experiences elsewhere.

North Carolina is not in the midst of a health crisis.

The following conclusions seem justified:

1. Improvement in vital statistics is a summary expression of total social and economic growth. Future improvements will come only from a deliberate emphasis upon programs for continued social and economic development in the broadest sense including, but not limited to housing, sanitation, nutrition, income, working conditions, and better education in healthful practices. Greater availability of medical care, more clinics and hospitals, and more physicians, nurses, and other health professionals, no matter how much in demand, cannot substitute for these broader determinants of the health of a population.

2. The available information on health status does not provide a basis for future projections of needs and demands for medical care or for health manpower needs, including the number of physicians.

3. Historically, medical care has not been a major determinant of improvements in health as measured by vital statistics. There is no reason to believe that new and expanded programs of medical care will materially affect these health

indices in the future. Great caution should be exercised:

- a. In citing these indices as a rationale for improving health care; or
- b. In claiming that expanded medical care will be reflected in significant changes in these figures.

4. The multiple determinants of health mean that government at the national, state, and local level must select priorities and allocate resources carefully to a wide range of programs if there is to be sustained improvement in the health of the citizens.

5. Because state resources are not unlimited, this report explores several alternatives for accomplishing an expansion of physician services in North Carolina in an attempt to arrive at recommendations as to how this may be done most effectively, most economically, in the shortest time, and with the greatest assurance of lasting results.

The Total Number of Physicians Needed (V-A)

Despite the widespread feeling and belief that there is a shortage of physicians in the U.S.,

there are virtually no generally applicable criteria for assessing the shortage in useful quantitative or qualitative terms. There are no established norms of need or demand for physicians' services in a given population. The physician/population ratio, expressed as the number of physicians per 100,000 population, is, at best, a crude, overly aggregated index of physician manpower and services because it "...does not measure physician services,... does not attempt to include an adjustment for quality,...treats all physicians as equal, or, if focused on a particular specialty as if all members of that specialty are homogeneous,...and ignores changes in productivity and in medicine itself."

Some of the major studies of U.S. physician manpower during the past 20 years have used the number of physicians required by organized, pre-paid, medical groups in making projections but application of this standard to the pluralistic system of medical care in the nation or a state has obvious shortcomings. Other studies have used the physician/population ratio of the northeastern U.S. as a norm, assuming that, because other areas showed a lower ratio, more physicians were

needed in those areas. That this is unrealistic is amply demonstrated by the fact that states in the northeast such as New York and Connecticut with the highest physician/population ratios are just as concerned about the "physician shortage" as are those in the rest of the country. The results of the major studies of U.S. physician needs that have been carried out during the past 20 years have been so variable (See Table V-A) that they contain nothing that provides a basis for planning in the nation or a state.

Since demand for physician services in the future seems limited only by ability to pay and is rising rapidly, it is probably true that no state, including North Carolina, has any cause to worry about "overproducing" M.D.s in the sense that the market might be glutted or that professional unemployment might occur. Recent experience and analyses, however, suggest strongly that, without a major reorganization of the present pluralistic system for providing medical care, the introduction of additional physicians will:

1. Aggravate the already existing socio-economic and geographic imbalance and inequity

of medical services, thus increasing rather than decreasing public dissatisfaction; and

2. Engender even greater overall costs for medical care both by the professional fees charged and the expenses of additional diagnostic and therapeutic procedures performed or initiated.

There are some authorities who believe that with recent increases in enrollment in U.S. medical schools, the critical period of nationwide shortage of doctors will be over by 1980. We do not agree with this estimate, but it is only fair to note that those who have espoused this view to not claim that U.S. medical care is satisfactory or adequate. They all emphasize a need to devote more resources to improve "the organization and delivery of medical care and physician mobility and productivity."

Comparisons by states of the physician/population ratio (using figures for practicing physicians only) show that North Carolina ranks 43rd in the country with 90/100,000, the national mean being 126/100,000. This supports the conclusion (despite the criticisms of this ratio as only a rough approximation) that there remains room for

substantial improvement in North Carolina's comparative national standing in physician manpower.

In 1970, there were 4,647 practicing physicians in North Carolina and the population of the state was 5,082,059, amounting to a physician/population ratio of 91.5/100,000. We have projected in this report (V-A-4) North Carolina's status in 1980, based upon enrollments in medical schools in the state and the U.S., past trends and attrition rates, and allowing 7 years between enrollment in medical school and entry into practice (4 years to earn the M.D. degree; 3 years for internship and residency training). In 1980, with a population projected to be from 5.558 to 6.048 millions, North Carolina will have 6,680 practicing physicians and a population/physician ratio of 110 to 119/100,000. During the 1970's, while North Carolina's population is increasing at about 1 per cent per year, the number of practicing physicians in the state will be increasing by almost 3 per cent per year.

This projection leads to the following conclusions:

1. From now until 1980 the major source of new physicians (excluding foreign medical

graduates) will be from the pool of students already enrolled in or recently graduated from medical schools. In other words, the size of the national manpower pool for which North Carolina must "compete" has already been determined with the entry of the new class of medical students in the fall of 1973 since these students will be entering practice in 1980.

2. Any additional efforts to increase the production of new M.D.'s in North Carolina or, indeed, in the nation after the fall of 1973 will yield results, in terms of additional numbers of practicing physicians, only in the years after 1980.

This projection, then, demonstrates the long-term nature of expanded programs of undergraduate medical education as a mechanism for alleviating the physician shortage. It also indicates that North Carolina must give high priority to various methods of recruitment of additional physicians into the state in the years immediately ahead if there is to be any improvement, beyond that now projected, during the rest of the decade of the 1970's.

The Geographic Distribution of Physicians (V-B)

In common with many other states, North Carolina suffers from an imbalance in distribution of physicians and physicians' services. This generally takes the following form:

--While urban and suburban areas are tending to improve their physician/population ratios, many rural areas show a steady deterioration in this index.

--As established rural practitioners retire or die, they are not being replaced by new physicians.

--The average age of rural physicians is considerably higher than that of physicians in other areas, boding ill for the future.

North Carolina presently contains no physician-less counties, however, although there are 21 such counties in the South Atlantic region and 133 in the U.S., including 4 in Florida, 16 in Georgia, 3 in Kentucky, 2 in Tennessee, and 23 in Texas (Table V-E).

The factors that determine the geographic distribution of physicians have been subjected to numerous empirical studies and analyses.*

*Many of these are reviewed in considerable detail in Section V-B-2 of this report.

These show that while the general characteristics of a community (climate, degree of urbanization, recreation facilities, quality of schools, cultural activities, etc.) are important in influencing the decision of most physicians to locate in practice, they cannot yet be ranked or weighted in any fashion that points the way to definitive action at the state level. It must be noted also, that this list includes many factors that are difficult or impossible to modify expeditiously or, indeed, which should be deliberately changed only for the purpose of attracting physicians. North Carolina is the nation's most rural state with few large urban foci. State planning for the future is deliberately calculated to continue this pattern so as to avoid urban congestion and its accompanying ills. The problem of physician distribution, therefore, must be solved within this larger framework which, by its nature, tends to minimize many of the factors known statistically to attract physicians to locate for practice. The bulk of the evidence suggests that success in rural recruitment is more likely if efforts are directed toward physicians with certain personal characteristics.

These include:

1. Physicians with avocations such as hunting, fishing, boating, or other pursuits facilitated in the area.
2. Older physicians whose children have completed their education and left home.
3. Younger physicians who are unmarried or have not yet begun their families.
4. Physicians whose early life was spent in small towns or rural areas.

It is difficult to assess the applicability of the results of the studies from the past in an increasingly mobile era that makes recreational areas as well as relatives in small home towns or rural areas ever more easily accessible from the cities and the suburbs.

A second set of factors influencing distribution includes the place that a physician goes to medical school and the place that he receives his postgraduate (internship and residency) training. The state in which the future physician attends medical school appears to be of decreasing importance. Less than half of U.S. physicians (44.2 per cent in 1963; 42.8 per cent in 1967 -

Table V-F) now practice in the state where they received their M.D. degrees. On the basis of trends in physician mobility in recent years, it is no longer clear that undergraduate medical education financed by a state will automatically yield an adequate return to the state on its investment in terms of physician manpower although national physician manpower is surely enhanced by every new M.D. awarded. This, of course, is the basis of the argument for federal support of medical education, an argument that is now falling on deaf ears in Washington.

When one looks at the influence of postgraduate (internship and residency) education upon eventual location of physicians, however, several things become clear:

--The number of residency positions available in a state is the most significant variable in explaining the number of physicians in a state.

--This is true for the U.S. (Table V-G) and for North Carolina (Table VII-D).

--If a state or region wishes to improve its "share" of physicians, the greatest "pay-off" will come from offering more internship and residency positions. These must be of high quality or they will not attract young M.D.'s and will merely create unused capacity.

The final and obvious factor influencing physician location is the medical resources of the community. These include: the accessibility of good hospital facilities, including radiological and laboratory services, availability of specialists and consultants to whom patients can be referred, the presence of professional colleagues with whom the workload and responsibility can be shared, and easy access to continuing professional education. The desirability of all of these so that a physician can render quality care to his patients is obvious and well-documented. The Special Committee of the Board of Governors stated the situation correctly in its 1972 report:

"Clearly, it behooves the state and the local communities to consider ways of getting adequate hospitals and other community health facilities strategically located over the state."

The Distribution of Physicians by Specialty and the Concept of the "Primary Care Physician" (V-C)

The increasing trend of physicians to enter specialty practice (as opposed to general practice, family practice or "primary care" practice) has been decried nationwide for many years. One result of this has been the firm establishment of the

idea that medical care for the citizens of the country would be improved if only the proportion of physicians in "primary care" practice (general practitioners, family physicians, internists, and pediatricians) could be increased. In general, we agree that there may be a relative oversupply of doctors in some specialties in the U.S. In North Carolina, however, where there is no doubt that more primary care physicians are needed, it is not at all clear that the need does not also extend to many medical specialties. At any rate, there is a real need for specialists in medicine and, with constant scientific and technological advances, the trend to specialize is likely to continue in response to these changes in medicine and as a result of the intellectual and professional motivations of individual physicians.

Much of the discussion of the primary care physician tends to overlook certain important points:

1. Primary care is a medical specialty in every sense of the word and it is not, as many seem to suppose, something that is mastered as a result of undergraduate medical education, leading

to the M.D. Proper preparation for primary care comes through postgraduate internship and residency training that is (and should be) every bit as rigorous and as disciplined as that which leads to other specialties.

2. The main purpose of the undergraduate medical curriculum is to give the student a general preparation, basic to all medical practice. If, as it can, the curriculum provides insight, encouragement, and experience to students in primary care, it can be expected that more graduates will choose to take postgraduate training in primary care residencies. That such a trend is underway at the UNCCH School of Medicine is documented in the Report of the Special Committee of the Board of Governors and we have independently satisfied ourselves that there is an increasing interest in primary care in successive classes at the UNCCH School of Medicine. This, we believe, is the result of "a deliberate attempt at orientation on the part of the school and a growing social consciousness on the part of the students."

3. The sometimes heard, unrealistic suggestion that physicians are being trained in

"too sophisticated" ways and that somehow or other there should be a way to dilute the training of primary care physicians so that they can get along "without all those fancy things" misses the mark completely. The range of knowledge and skills required for an individual to do good family practice is formidable indeed. If he practices in the professional isolation of a rural area, he assumes heavy responsibilities which, in other settings, would be shared with other professional colleagues but he must bear alone.

4. It is well to remember that many primary care physicians, particularly those in small towns and rural areas, have decided to leave this type of practice because of lack of facilities, inability to give quality care to patients, and professional isolation (including inaccessibility of continuing professional education).^{*} It behooves a state to examine what can be done to nurture the development and maintenance, in all

^{*}For a detailed discussion of the reasons primary care physicians leave practice, see Section V-B of this report.

regions, of those conditions that will tend to keep these new physicians in primary care rather than have them decide to turn elsewhere.

5. Finally, rather than misplaced emphasis upon undergraduate medical education as the vehicle for training primary care physicians, states would do better to support the establishment of quality postgraduate residency training programs in primary care since, as has already been discussed, the greatest influence upon location of physicians within a state is internship and residency training, not undergraduate medical education.

Student Loan Programs Tied to a Rural Service Commitment (V-D)

One of the suggestions which we heard most frequently in our consultations and discussions in North Carolina was the provision of loan funds to support medical education with a forgiveness of the indebtedness if the new physician agreed to practice for a certain length of time in a rural area. In actual fact, programs of this type have been tried in at least 22 different states, including North Carolina. Five of these plans have

been discontinued after 15-18 years, all but one on the basis of the finding that nearly all borrowing physicians chose to repay loans rather than enter rural practice.

Of the 17 remaining programs, only 11 have been in effect long enough to permit evaluation of their effectiveness. The aggregate results show that 60 per cent of borrowing physicians have chosen to "pay up" by practicing in rural areas. The "success rate" of the North Carolina Medical Care Commission Incentive Loan Program in this respect has been 58 per cent and physician manpower in 83 communities and 57 counties has benefitted from the program.

Clearly, it would be prudent for North Carolina to retain and, perhaps, to undertake to expand its present incentive loan program as part of a state-wide plan to increase physician manpower.

Increasing Physician Productivity

Historically the productivity of physicians in the U.S. has been increased primarily through the use of allied health professionals. North Carolina institutions have long taken a decisive lead in training physician's assistants (Duke, Bowman-Gray)

and family nurse practitioners (UNCCH). Experience in the state clearly indicates that these professionals improve the productivity of the physicians with whom they work and that they can be instrumental in extending accessibility of medical care in underserved areas. Many other state's are now seeking to emulate North Carolina's pioneering efforts in this important area.

It seems abundantly clear that the training of additional new health professionals should continue to receive high priority in North Carolina.

These individuals can also extend medical care by manning primary care clinics, with local physicians and nearby hospitals providing back-up services and support. There are several such clinics in the state already, created with the help of Duke, Bowman-Gray, or UNCCH, or on the initiative of a community alone. The proposal by Governor Holshouser in April, 1973, adopted by the General Assembly, to establish more of these clinics across the state is an important initiative that merits continuing support.

In our discussions and consultations within the state, we have been struck by the misunderstanding that seems to exist concerning primary

care clinics. Usually, the doubt takes the form of suggesting that the clinics represent a form of "second-class" care for rural citizens as opposed to "first-class" care for citizens in more urban regions. In actual fact, these clinics provide a setting in which a family nurse practitioner with supervision and back-up from physicians can do a very high proportion of primary care. Just as important, the clinics assure arrangements for referral of patients to physicians and their transportation to a hospital when necessary. These clinics, then, at the periphery of a network of care constitute an improvement within the present system of care, not a substitute for it.

The Production of Additional Physicians in North Carolina (VI)

Since it requires 7 years from entry into medical school until entry into medical practice, the earliest impact upon the number of practicing physicians in the state that could come from expansion of undergraduate medical education after 1973 in the three existing schools or from the establishment of a new school would be after 1980.

All three of the existing schools have planned to increase the size of their entering classes in the years after 1973. To summarize the situation, under present planning, the total number of entering students each year will rise from 328 in 1972 to 384 in 1976 and by 1980 the total enrollment of medical students will rise to 1,536 as compared to 1,124 in 1972. Of the students enrolled in 1980, 928 will be North Carolinians as compared to 625 in 1972. These existing plans will increase the number of M.D.'s awarded in the state by more than 50 per cent by 1980 and the number awarded to North Carolinians will rise by more than 60 per cent.

It must be emphasized, in the strongest terms, that the greatest constraint upon Duke, Bowman-Gray, and Chapel Hill in planning for any expansions whatsoever beyond these now projected is the limited availability within the state of teaching facilities for the instruction of additional medical students. The ability of the schools to implement these projected increases on schedule will be entirely dependent upon the development of additional teaching services in the state and all

three institutions are presently working to accomplish this.

In addition to this lack of facilities in which to give clinical training to enlarged classes of medical students, the two private schools face the possibility of a serious deficiency in operating funds because federal support for medical education is shrinking, funding from private sources is limited, and costs are rising steadily. While neither of the private schools is in a position to commit itself to increasing total enrollment (beyond that now projected), both have responded to state funding since 1969 by expanding the number of North Carolina's students enrolled. Both have indicated their willingness to further increase the proportion of North Carolinians enrolled on the condition that they be paid an annual sum from the state equal to that received by the UNCCH School of Medicine for each undergraduate student. This now amounts to about \$9650 per year. Under such conditions of "parity," the two private schools would be willing to charge North Carolinians the same tuition that UNCCH charges, thus permitting

accepted North Carolina applicants to select a school within the state without concern for the tuition differential (\$950 at UNCCH, \$2450 at Bowman-Gray, and \$2540 at Duke). Such a plan might also keep in North Carolina a good number of excellent applicants who now choose to attend "prestige" schools outside the state.

Since the further expansion of medical education in North Carolina will be paced by the rate at which additional clinical teaching capacity for medical students can be developed, it is clear that the state should accord highest priority to the creation of this capacity. It is important to understand what commitment to such an effort involves. Most of the first two years of medical school are spend in courses in basic medical sciences and, after a short period during which the student is instructed in how to deal with patients, the last two years consist of carefully supervised clinical experience during which, as a "clinical clerk," the student examines patients, carries out diagnostic tests, and prescribes treatment. This crucial phase of medical education is widely misunderstood. It must be

carried out under skilled clinical teachers who have the time to be available when needed by the student. Clinical training of medical students is not accomplished simply by turning students loose in a hospital or clinic full of patients and it cannot be made the major responsibility of busy, usually overworked practitioners whose first duty is and should be the care of patients who come to them for help. Interns and residents, because they are closer to the student, because they are readily available in the hospital setting, and because they are learning themselves, contribute enormously to the education of medical students and their presence is almost a sine qua non for the clinical training of students. The skill and experience of practitioners is an excellent supplement to the student's learning and is used with good effect in most medical schools. It is quite unrealistic, however, to think that the supervision of clinical clerks can be left to part-time teachers; someone must take fulltime responsibility for the student's education during this period.

There exist in North Carolina excellent possibilities for expeditious expansion of

undergraduate medical education when the bottleneck of clinical instruction is eliminated. If the problems of quality and accreditation of the present one year medical program at ECU* can be solved, additional basic science instruction could be provided there for medical students. In a relatively short time and at very low cost, the excellent graduate program in biology at NCSU* could offer a similar preclinical curriculum for medical students.

In North Carolina, as elsewhere throughout the U.S., there is a need to expand opportunity for admission of minority students into medical school. The state needs an organized effort to provide better premedical education and more effective recruitment of minority students for medicine. The present SREB contract with Meharry Medical College should be maintained and a more realistic program of financial aid should be designed and implemented.

*The details of these potential programs are contained in Section VI-B-5-c of this report.

The Present One Year Medical Program at ECU

Because the ECU one year program and the proposal to expand it into a new, four year medical school have featured so prominently in recent discussions of the physician shortage in North Carolina, we will not attempt to summarize our findings and evaluation in this complex situation here. Instead the reader is referred to the detailed statement in this report.

--In Sections VI-C-1 and VI-C-2 we have reviewed the findings of the Survey Team of the Liaison Committee on Medical Education concerning the one-year ECU program at the time of its accreditation visit to UNCCH School of Medicine in January, 1973. We have indicated our substantial agreement with the Survey Team report. We have added our own direct observations, based upon three separate conferences since April, 1973 with those responsible for the program, a review of written material supplied to us spontaneously and by request, and a visit to the Greenville campus. We have concluded that the only hope for the program is to assign complete authority and responsibility for upgrading and maintaining it to UNCCH. If

the program is to become viable, it must be treated as what it is, a part of the undergraduate program of the UNCCH School of Medicine. UNCCH must take firm and decisive control of curriculum, faculty selection, student selection, administration, and planning.

The Proposal to Establish a Four Year Medical School at ECU.

In Section VI-B-3, we have taken the schedule provided to us by the ECU administration of the numbers of students that would be admitted on a year-by-year basis if the decision were made to develop a four year, degree-granting medical school on that campus and have projected the numbers of M.D. degrees that would be awarded and the numbers of physicians that would enter practice in North Carolina, making the generous assumption that all who received M.D.s from the new school would eventually settle in North Carolina as practicing physicians (See Table VI-D).

In Section VI-B-4, we have made a conservative estimate of the costs to the state of establishing and operating a new medical school (See Table VI-E).

Finally, in Section VI-C-3, we have examined the feasibility of establishing such a school at ECU.

It is our judgement that the proposal to commit state resources to establish a new medical school at ECU is premature and is based upon a lack of understanding of what the establishment of such a school would involve.

Recruitment and Retention of Additional Practicing Physicians for North Carolina (VII)

North Carolina has reached a point when it must give high priority to programs to expand the number of teaching hospitals for medical students and for residents. This conclusion is based upon the following:

--Any significant increase in physician manpower in North Carolina before 1980, beyond the numbers already projected must come from improved recruitment of individuals already enrolled in U.S. medical schools or recently graduated M.D.s now completing residency training.

--The most significant single determinant of a state's physician manpower is the total number of residency training places available within the state.

--Increased production of M.D.'s in North Carolina by the three existing

schools or by an additional school will be possible only if additional teaching facilities for the clinical instruction of medical students can be developed in the hospitals of the state.

The prospects for establishing and filling more residency positions in North Carolina are excellent. Residencies have increased in the state by 41 per cent since 1967 as compared to 29 per cent for the country and these have attracted a large percentage of acceptances (89 per cent in 1971) than the national average (84 per cent in 1971).

A survey of hospitals in North Carolina indicates ample bed capacity in several areas to accommodate new residency programs, an example being Fayetteville where there are more than 1500 beds in 4 hospitals and no such programs exist.

Other possibilities to enhance recruitment of additional practicing physicians into North Carolina include:

--Because of existing stringent citizenship requirements for licensure of graduates of foreign medical schools (FMGs) to practice in North Carolina, the state has an unusually low number of these individuals in practice. By relaxing this requirement, without changing professional qualifications,

the inflow of FMGs could be increased.
(VII-C-1).

--The creation of a systematic, personalized effort to recruit young physicians just completing post-graduate training in surrounding states has been shown to be feasible and, this year will be given its first full trial by the Division of Education and Research on Community Medical Care of the UNCCH School of Medicine and the North Carolina Department of Human Resources. The cost of such an effort is low and the potential "pay-off" is great.

Area Health Education Centers (AHEC) (VII-B)

The increase in the number of residencies offered in North Carolina Hospitals until now has resulted mostly from the development of affiliations between community hospitals and the medical schools to provide more and varied clinical education for medical students and for resident physicians based in the academic centers. Using federal funds, UNCCH School of Medicine has begun during the past year a major, innovative, collaborative effort to establish Area Health Education Centers, the central purpose of which is to bring about a better distribution of health manpower, especially in rural areas, emphasizing availability and accessibility of primary care services.

AHECs have already been established in Charlotte, Wilmington, Raleigh, Asheville, and Planning Area L (Rocky Mount, Tarboro, Roanoke and Wilson). Additional AHECs are under discussion or negotiation in Greensboro, Fayetteville, and Greenville.

The existing AHECs already have compiled a solid record of achievement including expansion and establishment of primary care residencies, regional training of family nurse practitioners, recruitment of physicians, the training of nurses, anesthetists, technologists, and provision of additional clinical experience for 3rd and 4th year medical students.

Expansion of the AHEC concept could contribute enormously to emphasizing those incentives known to influence the eventual location of physicians in practice:

- They could provide medical students with early experience in small communities.

- They could greatly expand the number of residency places for primary care in the state.

- They can greatly enhance the professional environment for practicing physicians by providing consultants and

referral services and programs of continuing education.

In addition, they can assure the availability of nurses, laboratory and x-ray technicians, pharmacists, in the area.

Finally, by providing services to smaller hospitals in the region, the base hospitals of each AHEC could form major nodules in a statewide network which would, in rural regions, provide access through primary care clinics with successive referral of patients to physicians, local hospitals and regional hospitals as needed to assure prompt and appropriate care.

We believe that the state should be prepared to invest its funds along with those of the federal government already available to accelerate this organization of education and care under the comprehensive concept of AHECs and to provide support for capital construction and the provision of health care which cannot be supported by federal funds which are restricted to education and training.

The Board of Governors should undertake the preparation of a plan calculated to assure

acceleration of the development of the AHEC concept. The plan should provide for a mechanism to enable the two private medical schools to share with UNCCH the burden of development of regional centers using their expertise and educational resources in an organized, integrated, statewide effort. In Section VII-B-5 of this report, we have outlined some of the elements that such a comprehensive plan should include as well as some "ball-park" estimates of capital and operating costs.

We are unanimous in concluding that this is the most important opportunity open to the state for increasing physician manpower, for extending the availability of physicians' services and for assuring a continuing improvement in the availability and quality of medical care for all North Carolinians.

III. RECOMMENDATIONS

There is a clear need in North Carolina for continued improvement in the quality and accessibility of medical care in all regions of the state, rural, suburban, and urban. As is true in other parts of the nation, public demand for better care in North Carolina has tended to take the form of calling for measures to alleviate the "physician shortage" and physicians' services throughout the state certainly should be expanded as expeditiously as possible. More physicians alone, however, is not a panacea for medical care in North Carolina or any other state. Progress will also require a continuing adequate supply of dentists, nurses, pharmacists, and other health professionals; it will require properly located and adequately equipped physical facilities; and it will require improved organization and planning for the delivery of care where and when it is needed.

We have recognized and discussed these broader dimensions of health care in this report but our major recommendations to the Board of Governors, presented below, focus upon the expansion of

physician manpower in North Carolina for three reasons: it is the main problem that we were called upon to analyze for the Board; it is essential to future improvement of the quality and accessibility of medical care for the state's citizens; and it is surely a clear responsibility of the state's institutions of higher education.

The reorganization of the University of North Carolina under the Board of Governors presents an opportunity to develop an integrated, statewide plan for medical education that will draw upon the collective strengths and expertise of the state and private schools, will assign responsibility and resources for developing and operating programs, and will utilize, in a coordinated fashion the many hospitals of the state to develop a network for education, training, and improved medical care.

The decade of the 1960s was an era of notable progress in medical education by the UNCCH School of Medicine, and the two private schools, the Duke University School of Medicine and the Bowman-Gray School of Medicine. Each of these institutions, acting largely to fulfill its own requirements

for expanding undergraduate and postgraduate (internship and residency) training, developed affiliations with various hospitals throughout the state. Utilizing the opportunity provided by the flow of federal money for biomedical research and training, each school began to draw upon hospital resources beyond those on its own campus and to extend the benefits of its expertise in education and in patient care over the state. These three institutions have also pioneered in the development of programs to train new types of health professionals who can directly extend the effectiveness and productivity of physicians, the physician's assistant (PA) and the family nurse practitioner (FNP).

Through these largely uncoordinated efforts, the three schools have expanded their output of M.D.'s and, in 1973, they have reached a point where any additional expansion of undergraduate medical education will be possible only if additional teaching facilities for the clinical instruction of medical students can be developed within the hospitals of the state (See Section V-B-2).

Because there is a "lag-period" of 7 years (4 years to complete the M.D. and 3 years for

internship and residency) training between entry into medical school and entry into practice, the size of the pool of new M.D.'s for which North Carolina will be "competing" for the rest of the decade of the 1970s has already been determined with the entry of new medical school classes in the fall of 1973 since this class will be entering practice in 1980. (See Section V-A-4).

Any further expansion of medical school enrollment in North Carolina or the nation can be expected to yield results, in terms of additional practicing physicians, only after 1980.

This means that any significant increase in physician manpower in North Carolina before 1980, beyond the numbers already projected, must come from improved recruitment of individuals already enrolled as medical students or recently graduated M.D.s now completing residency training.

An examination of educational factors that influence the decision of physicians to enter practice in a state has shown that the most important single determinant of a state's physician manpower is the total number of residency training places available within the state. (See Section V-B-2).

Finally, a very important determinant of specific location of practice within a state is the availability to a physician of opportunities for continuing professional education, consultation, and patient referral (See Section V-B-2).

Taken together, these facts mean that, from the point of view of future expansion of undergraduate medical education and the production of additional M.D.s within the state and the recruitment of additional physicians from outside the state, North Carolina has reached a point in 1973 when it must give highest priority to programs to expand the number of teaching hospitals for medical students and for residents.

A survey of hospitals in the state that are not now used for teaching shows clearly that there is the capacity to expand clinical teaching in a major way (See Section VII-A-2).

An expansion of teaching hospitals in the state can be accomplished only through the leadership of the three existing medical schools in collaboration with the boards of trustees of the community hospitals and the practicing physicians in each region.

The medical schools have the experience and the expertise to do the job and, furthermore, after 1975, accreditation of residency programs in all hospitals will require affiliation with a medical school.

During the past year, the UNCCH medical school, using federal funds, has begun an organized, innovative, collaborative effort with several hospitals in the state to create Area Health Education Centers (AHECs), the purposes of which include the education of medical students, interns and residents, continuing education for physicians with emphasis on primary care physicians, undergraduate and continuing education of other health professionals, regional training of family nurse practitioners, and provision of support for smaller community hospitals and primary care clinics in the area (See Section VII-B). The existing centers have already achieved notable success and we believe that the state should build on this concept and accelerate the pace of its development throughout all regions.

Recommendation 1.

We recommend that the Board of Governors prepare a plan to build upon the concept of AHECs and to develop a statewide system of medical and health education, based in hospitals in all regions of the state, and organized in such a fashion to provide resources to enable the Duke University School of Medicine and the Bowman-Gray School of Medicine to share with the UNCCH School of Medicine in the task of implementing the plan, using the expertise, experience, and educational resources of all three institutions in an organized fashion, integrated into a statewide effort.

One of the goals of the plan should be the creation of 250 to 300 additional primary care residencies as quickly as possible and to expand the facilities available for the clinical training of medical students.

While the plan should provide for cost-sharing between the community and the state for the operation of the centers, a major investment of additional state funds will be needed. The plan should include provision for (See Section VII-B-5):

--Capital costs for additional construction at the participating hospitals to provide the additional educational facilities and patient care facilities required in teaching hospitals.

--Operating costs, including stipends for fulltime medical and other professional teaching faculty; stipends for interns and residents; support for medical student travel and housing; support for travel of consultants from the medical schools to the centers; and educational expenses including expansion of library facilities, visual aids, etc.

The plan should provide for the acceleration of existing AHECs and for the development of additional centers in all regions of the state.

In terms of the specific problem of physician manpower, the AHEC organizations and programs can contribute enormously to recruitment and retention by:

--Expanding the number of primary care residency places in the state,

--Providing medical students with a part of their clinical instruction in smaller communities, giving early experience in that environment, and

--Greatly enhancing the professional environment for practicing physicians by providing consultants and referral services, colleagues with whom to share professional duties, and programs of continuing education.

Recommendation 2.

We recommend that the Board of Governors assign explicitly to the School of Medicine of UNCCH clear responsibility and authority for all programs of undergraduate, postgraduate, and continuing medical education conducted within the University of North Carolina system.

This assignment should carry with it unequivocal control, at the operational level, for planning, curriculum development, selection and appointment of faculty, and budgeting for existing and future programs without regard to the geographic location of the program within the University or within the state.

We also recommend that there be no commitment of state resources for the establishment of a new four year medical school within the University of North Carolina. (See Sections VI-B-3, VI-B-4, VI-C-3). If and when additional teaching services are established in the state, including the Greenville area, the establishment of an additional school will become a feasible alternative to be weighed against using such new teaching capacity

to expand enrollment in existing schools which are now rate limited in their expansion by the availability of clinical teaching services for medical students.

Recommendation 3.

Specifically, we recommend that the Board of Governors assign to the School of Medicine at UNCCH the direct administrative and operating responsibility for upgrading and maintaining the existing one year medical program at ECU with firm authority over admission and promotion of students, selection and appointment of faculty, redesign of curriculum, and budgeting for operations as well as capital expenditures.

We recommend that the size of the class admitted to the ECU program in 1974 be held at 20 students and that the quality and the accreditation status of the program be reviewed again in the latter part of 1974 or early 1975. If progress has been satisfactory, consideration should be given to expanding the entering class in 1975 to 25 or 30 students. If improvement in the program occurs and is sustained and if the development of additional capacity within the state to give clinical education to medical students warrants, it may then become feasible and desirable to further expand class size and to add a second year of medical education to the program.

Recommendation 4.

We recommend that the allocation of state funds to Duke University School of Medicine and to Bowman-Gray School of Medicine for the enrollment of North Carolinians be made on the basis of "parity" with UNCCH in such a fashion that the two private schools would receive an annual sum for each North Carolina student equal to that received by UNCCH from the state.

In return, the private schools would charge North Carolinians directly for the same tuition they would pay at UNCCH. This would further increase the number of North Carolina residents attending medical school in the state, would enable accepted residents to select the medical school in the state that they wish to attend without concern about the tuition differential, and might well keep in North Carolina excellent applicants who now choose to attend "prestige schools" outside the state.

We believe that the Board of Governors should seek authority to contract directly with the private schools for these places for North Carolina residents.

Recommendation 5.

We recommend that the administration of the Incentive Loan Program be transferred from the North Carolina Medical Care Commission to the University of North Carolina and that the program be revised from time to time to assure maximum effectiveness in accomplishing its objectives.

We believe that this program should become an integral part of an overall, integrated state plan for medical education under the leadership of the Board of Governors of the University of North Carolina.

Recommendation 6.

We recommend that the existing SREB contract with Meharry Medical College be continued. In addition, we recommend that:

1. There be organized by the University, in cooperation, if feasible, with the Old North State Medical Society, a statewide program to interest more qualified minority students at the high-school and college level in medical careers, to improve opportunities for premedical education for such students, and to assure that premedical counselling is of the very best.

2. The University seek authority and funds to set up a program of special financial aid for North Carolina minority students who are admitted to medical schools in the state or to schools outside the state and who need financial help. Such a program should provide for scholarships as well as loans since experience has shown that this combination is necessary to attract many minority students into medicine and since scholarship aid from sources such as the National Medical Fellowship Fund is now insufficient for this purpose.

3. That the development of additional residency training opportunities within the state (Recommendation 1) be accompanied by an intensive organized effort to increase the number of minority medical graduates who accept such positions in North Carolina.

Recommendation 7.

We recommend continued cooperation between UNCCH and the Department of Human Resources in the development of systematic, personalized recruitment into the state of young physicians completing postgraduate training in nearby regions outside of the state (See Section VII-C-2).

Recommendation 8.

We recommend that the Board of Governors take the lead in assuring that serious consideration is given by the state to modifying its present citizenship requirements for licensure of foreign medical graduates to enter practice in North Carolina. Such a modification would involve no change in requirements for professional qualification and would surely increase the immigration of such physicians into the state (See Section VII-C-1).

Recommendation 9.

We recommend that the Board of Governors take steps to establish a continuing census of physician manpower, undergraduate medical enrollment within the state and enrollment of North Carolinians in out-of-state medical schools, residents in training in North Carolina hospitals, North Carolinians in residency training programs outside the state, etc. The timely availability of analyses of this information which could be compiled regularly from sources such as the North Carolina State Board of Medical Examiners, the medical schools of the state, the Association of American Medical Colleges, and the American Medical Association would be extremely helpful in monitoring the effectiveness of existing or future programs of education and recruitment, in sharpening state physician manpower projections, and in guiding the University in the establishment of new or expanded programs of undergraduate or postgraduate medical education.

Recommendation 10.

We recommended continued support for the training of other health professionals within the University both in regular academic programs and under the expanding Area Health Education Center concept. We also recommend that the University of North Carolina support in every possible way the accelerated development of a network of community primary care clinics throughout the state to improve access to the health care system for North Carolinians in all regions of the state.

Recommendation 11.

We recommend that the Board of Governors take the following steps to assure better administration of its programs in health education:

1. Designate from its membership a committee or other standing group whose sole responsibility will be the overview of the University programs of medical and other health professional education, including the expansion and operation of AHECs throughout the state, and coordinated efforts involving the two private medical schools in the state. It is our perception that the Board would be better served if this function is assigned specifically and is not treated simply as a part of the general academic affairs of the University. The involvement with many institutions that are not primarily educational in many areas of the state, the coordination of efforts between distinct units of the University, and the integration of these efforts as part of a joint endeavor with the two private medical schools will require continuing attention and will involve special difficulties that differ considerably from most other programs for which the Board is responsible.

2. Add to the Administrative staff of the University a senior officer to be designated Vice-President for Health Affairs (or some similar title). The position should be filled by an individual with a national reputation for experience and competence in medical education and administration. He should be responsible to the President of the University and the Board of Governors for such things as systemwide planning and budgeting; contractual arrangements for undergraduate education or the development of postgraduate programs with Duke and Bowman-Gray, student aid and incentive loan programs for North Carolina residents, including minority students, programs of recruitment and premedical counselling, a continuing census of health manpower, and all programs of health-related education and research undertaken by the University. Under the authority of the President and the Board, he should have direct access to the administrators of schools and educational programs with a minimum of red-tape in order to facilitate the implementation and operation of the University's statewide programs of education in the health field. He should be provided with staff assistance appropriate to these duties.

IV. THE HEALTH STATUS OF NORTH CAROLINA

Since the current concern about increasing physician manpower in North Carolina has as its ultimate aim better health for the citizens of the state, it is the purpose of this section to examine some of the information concerning the past and present health status of North Carolinians, to review the rate of improvement in recent years, and to compare North Carolina's performance and status with those of other states, those of the South Atlantic Region, and those of the U.S. as a whole. At the outset it can be stated that the available data for North Carolina and for the nation are limited and their significance must be interpreted with care. Indeed, so restricted are the firm conclusions that can be drawn from the health statistics that have been compiled through the years that the major reason for discussing them in this report at all is to emphasize their inadequacy in depicting the true nature, qualitative or quantitative, of health problems in a population and, consequently, their inadequacy as a basis for planning health care systems or projecting health manpower needs.

A. Health Indicators and Vital Statistics.

1. Inadequacy of Present Data - Unfortunately, there are severe limitations upon our ability to assess the health status of a population group or to compare the health of different populations. The available measurements are much too rudimentary for this purpose because traditional vital statistics consist, for the most part, of such gross indicators as infant mortality, number of hospitalizations, and death rates. There has long been and remains an urgent requirement in this country to develop indicators and statistical survey methods that will be sensitive at levels far below the catastrophic events presently recorded. This universal need for major improvements in the scope, refinement, and comparability of our health statistical system led the President's Science Advisory Committee to state in 1972:

"We are more advanced at counting livestock and produce than in measuring the parameters of health

services and health status, and we lag behind many other countries in the development of our health statistical system."*

The general purpose data currently collected are not sufficiently sophisticated, they cannot be applied to action programs on a timely basis, they have no predictive value for demands on the health care system or for the ability of the system to respond, and they are greatly influenced by many social and economic factors that are quite unrelated to the accessibility of medical care.

2. Health and Medical Care - Perhaps the most serious misinterpretation of health statistics arises from the confusion of health and medical care. A recent example of this is found in the much-quoted Carnegie Commission Report on Medical and Dental Education.** Despite the statement that the Report

*Improving Health Care through Research and Development, Report of the Panel on Health Services Research and Development of the President's Science Advisory Committee, March, 1972, U.S. Gov't. Printing Office, Washington, D. C. 20402.

**Higher Education and the Nation's Health: Policies for Medical and Dental Education, a special report and recommendations by the Carnegie Commission on Higher Education, McGraw Hill Book, Co., New York, 1970.

is concerned primarily with health manpower, it is structured in such a way as to leave the impression that the results of the educational reforms that are suggested will be reflected in a major change in the health statistics of the United States:*

"The record of the United States in prolonging life expectancy and preventing infant mortality is not impressive when compared with the experience of many other industrial countries . . .

"Among 22 industrial countries, the United States ranked 19th in male life expectancy and 6th in female life expectancy in 1967 . . .

"If we consider infant mortality, we find a somewhat similar pattern . . .

"Not only are our rankings low, but the gaps between the United States rates and those in the highest ranking industrial countries are substantial. Among the factors that perhaps explain this situation are our relatively heterogeneous population, the fact that some of the other industrial countries have placed greater emphasis on preventive care and mass education relating to healthful practices, and the fact that every other industrial country has either a national health insurance system or a national health service."

*See the Report, pp. 13-15.

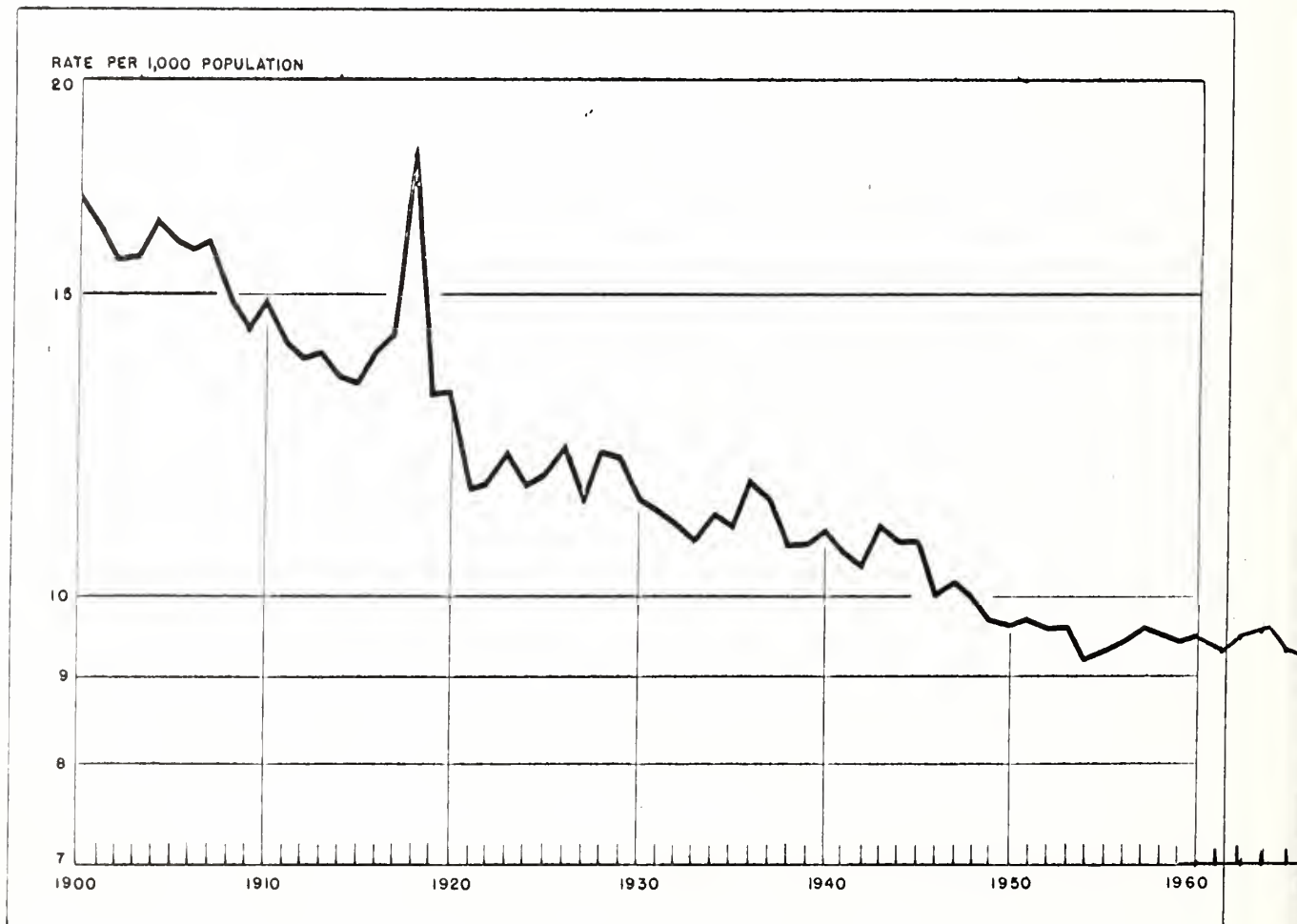
If one defines health ideally, as does the World Health Organization, as the realization and enjoyment by every human being of full physiological and psychological potential, then, as Gerard Piel* has pointed out, medical care actually comes near the last of the measures we would consider in pursuit of health as a social value.

This is not at all to deprecate the importance and necessity of access to medical care but only to emphasize that medical care is merely one of the determinants, and, indeed a rather minor one, of the overall health of a population. Health is dependent upon pure water, safe and nutritious food, clean air, and adequate housing. It is determined by customs, habits of eating, exercise, avoidance or use of alcohol and tobacco, and numerous other individual and group behavior patterns. There are also many genetically determined human diseases which medical research is only beginning to unravel.

*Piel, G.: Improving the Nation's Health: Joint Leverage for Economic and Social Adjustment, in Social Economics for the 1970's, Dunellen Publishing Co., Inc., New York, 1970.

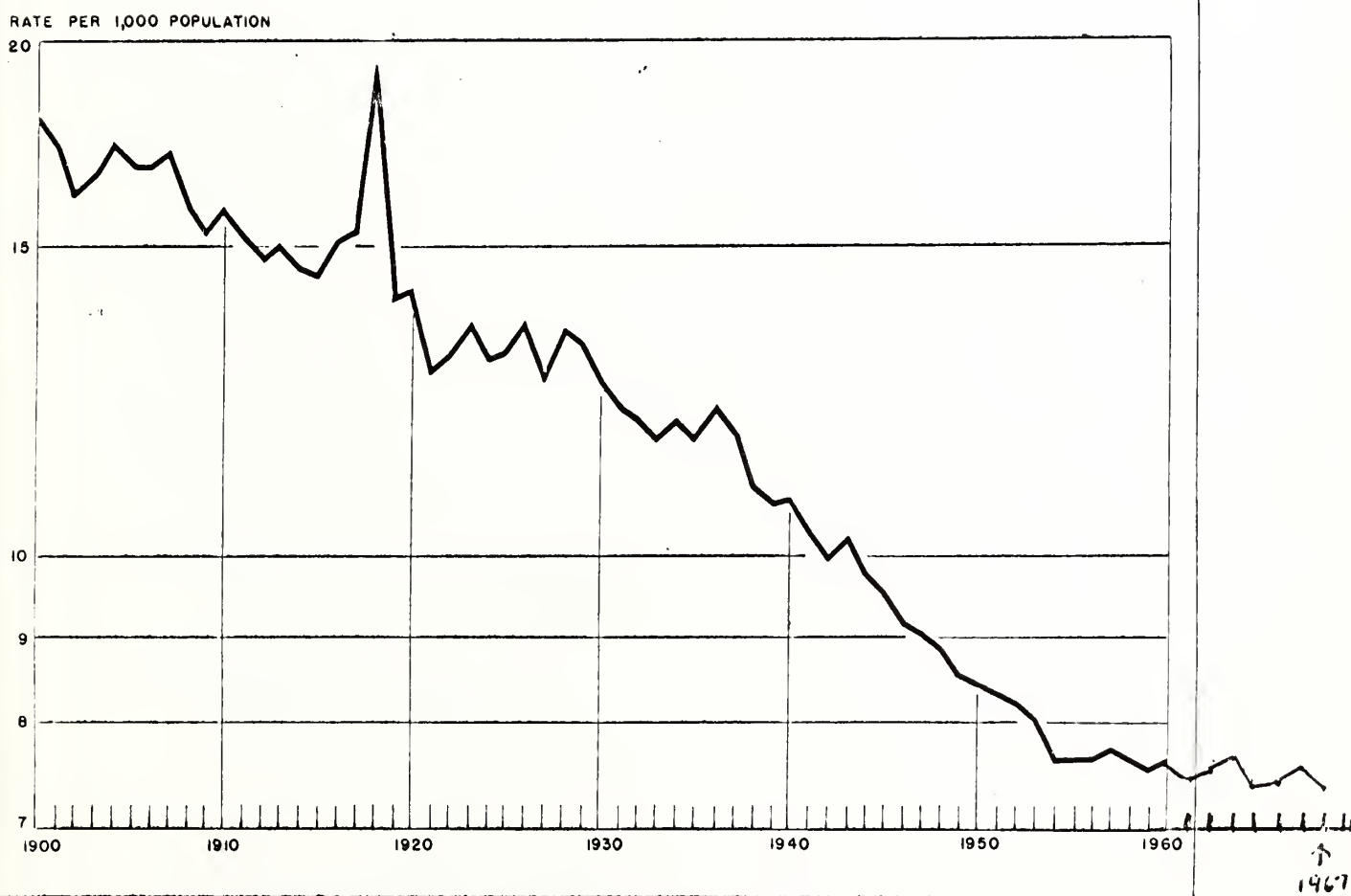
Since 1900, there has been an increase in life expectancy in the U.S. from 47 to 70 years and the crude death rate has fallen from 17.2 to 9.6 per thousand population (Figure IV-1). These figures are often cited as testimony to the miracles of medical science and used as arguments for more and better medical care. This tribute, however, does not really bear up under closer analysis. The falling curve for the age-adjusted death rate in the U.S. since 1900 (Figure IV-2) shows three distinct segments and affirms the distinction between medicine and health. Over the first 35 years, the death rate fell from 17.2 to 11 per thousand, nearly 80 per cent of the improvement since the turn of the century. During this period, medicine, as we know it today, played a negligible role simply because there was very little that the physician at the bedside could do. The drop was attributable to improved water supplies, food inspection, indoor plumbing, sewage disposal, improved housing, and other accompaniments of modern technology, the results of a far wider range of engineering and professional competence than that of the field of

FIGURE IV-1
CRUDE DEATH RATES, U.S., 1960-67.



Source: Vital and Health Statistics, U.S. Dept.
H.E.W.

FIGURE IV-2
AGE-ADJUSTED DEATH RATES, U.S., 1900-67.



Source: Vital and Health Statistics, U.S.
Dept. H.E.W.

medicine. In a word, the decline in the death rate is a summary expression of total social and economic growth.

In 1900, as Dr. Walsh McDermott* has pointed out, 25 per cent of all U.S. deaths were infant deaths and half of these were caused by non-specific diarrheas and non-specific pneumonias, disorders for which specific therapy is still largely lacking. As John Boyd-Orr, founder of the U.N. Food and Agriculture Organization put it:

"The one is caused by bad feeding and the other by bad housing."

In the developing countries, these diseases continue to take their toll of infants: in the U.S., they are now largely isolated in the enclaves of urban and rural slums.

The second phase of the reduction in the U.S. death rate occurred between 1935 and 1955. This was largely a result of the introduction of modern chemotherapy which eliminated bacterial diseases as

*McDermott, W.: Environmental Factors Bearing on Medical Education in Developing Countries, Modern Medicine and the Demographic-Disease Pattern of Overly Traditional Societies. A Technologic Misfit, Journal of Medical Education, Vol. 41, Supplement, pp. 137-162, Sept., 1966.

leading causes of death. The elimination of poliomyelitis by immunization in the middle 1950's made no impression on the curve at all although this is looked upon, and rightly, as one of the great medical triumphs of all time. Poliomyelitis, however, was never a great killer, and the benefits of vaccination in terms of decreased illness and long-term crippling disability would not be expected to show up in mortality statistics.

Since 1955, the death rate has run parallel to the baseline, with occasional fluctuations attributable to years in which there were outbreaks of influenza, a disease which characteristically produces fatalities in elderly patients with chronic heart or lung disease and other debilitating chronic disorders.

As for the gap between infant mortality in the U.S. and that in other industrialized countries, so frequently referred to by those who decry the quality of U.S. medical care, the discrepancy is explained on very different grounds if the figures are examined in detail. The death rate for non-white infants, wherever recorded in this country, is about twice that for white infants. The figures in Table IV-A portray this finding.

TABLE IV-A
INFANT DEATH RATES

(Deaths per 1000 live births; represents infants under 1 yr. old)

	<u>1960</u>		<u>1968</u>	
	<u>White</u>	<u>Other races</u>	<u>White</u>	<u>Other races</u>
United States	22.9	43.2	19.2	34.5
South Atlantic*	23.6	47.2	19.6	36.2
East South Central**	25.6	48.4	20.9	40.5
North Carolina	22.3	52.4	20.9	38.7
Virginia	24.6	45.5	18.7	36.2
South Carolina	23.9	48.5	20.5	37.4
New York	21.5	41.6	18.3	33.5
Texas	26.3	43.9	19.8	35.6
Washington	22.7	36.7	19.0	28.6

*Includes Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

**Includes Kentucky, Tennessee, Alabama, Mississippi.

Source: Statistical Abstract of the U.S., 93rd Edit., 1972.

Since color and poverty in the U.S. are so intertwined, it becomes obvious that family income plays a key role in the life and health of the disadvantaged. Several studies, including one by Dr. Paul Densen for the Health Insurance Plan of Greater New York,* have shown a close correlation between high infant death rates and low income, regardless of race. The relationship between low-income, poor health, and deficient medical care is well-documented.**

*Cited in Piel, G., op.cit.

**Health is a Community Affair, National Commission on Community Health Services, Harvard University Press, Cambridge, Mass., 1967.

U.S. Public Health Service, Medical Care, Health Status and Family Income, Publication 1000, series 10, No. 9, U.S. Dept. of HEW, National Center for Health Statistics, 1964.

Comparisons of the Uninsured, Those with One Policy and Those with Multiple Coverage, Blue Cross Report, Vol. 5, pp. 1-8, 1967.

Strauss, A.L., Medical Organization, Medical Care, and Lower Income Groups, Social Science and Medicine, Vol. 3: 143-177, 1969.

Piel* has calculated that if the "poverty-specific" death rates were subtracted from the U.S. experience, the overall death rate would drop from the present 9.4-9.6 to 7.3 per thousand which exceeds the best experience anywhere in the world.

To return to the Carnegie Commission Report, it is not too much to say that if all of its recommendations for health professional education were implemented immediately, there would be no reason to expect any significant change in health statistics such as death-rates or life expectancy. Yet, by emphasizing these indices as being related to availability of medical care and health manpower, the Report leaves the distinct impression that by modifying and expanding medical education, the U.S., in some magical fashion, will forge ahead in the international health statistical steeplechase.

In summary, as Piel** has put it:

"...it is perfectly clear that we must bear in mind the distinction between

*Piel, G., op. cit.

**Piel, G., op cit.

health and medicine. By the application of the best medical care available we could not do much about the infant death rate of our poor. The infant death rate and the rate of premature delivery have a great deal more to do with the height-weight ratio of the adolescent unmarried mother who bears a child than with the kind of medical care she happens to have the luck to get. The intervention of medicine in the first trimester of her pregnancy is not going to do much about the blight already laid on the child in her womb."

B. Some Comparative Health Statistics for North Carolina.

Tables IV-B through IV-E portray in some detail the health statistical record of North Carolina, the U.S., the South Atlantic Region, and selected states. Subject to all of the cautionary statements in the foregoing section of this report about the lack of correlation of these indices and medical care, North Carolina compares favorably in most parameters and the rate of improvement of the figures for North Carolina through the years has been comparable to that in the country at large.

1. Overall Death Rates (Tables IV-B and IV-C). The crude death rates, shown in Table IV-B measure only the total deaths per 100,000 population. While the rate has declined in the

TABLE IV-B

CRUDE DEATH RATES
(Deaths per 100,000 population)

	<u>1940</u>	<u>1950</u>	<u>1960</u>
United States	1076.4	963.8	954.7
South Atlantic Region	1059.9	885.7	908.0
NORTH CAROLINA	898.2	766.4	837.5
Delaware	1223.6	1100.6	938.0
D. C.	1302.5	1067.1	1149.5
Florida	1208.3	958.7	972.5
Georgia	1040.8	880.4	896.7
Maryland	1213.8	956.8	902.0
South Carolina	1062.5	849.0	868.3
Virginia	1104.6	895.2	868.7
West Virginia	926.7	869.0	971.1
Other States			
Alabama	1042.4	876.5	927.5
Kentucky	1044.9	945.9	986.1
Minnesota	960.3	939.5	927.8
Mississippi	1060.3	953.9	998.3
New Mexico	1051.7	803.2	686.1
Tennessee	1025.6	893.9	922.3
Texas	974.4	821.5	808.5
Vermont	1283.3	1103.1	1135.7
Washington	1152.5	945.2	929.9

Source: Grove, R.D. and A.M. Hetzel. Vital Statistics Rates in the United States, 1940-1960.
U.S. Dept. H.E.W., Public Health Service,
Washington, D.C.:1968.

U.S. since 1940, that in the South Atlantic Region and in North Carolina, Florida, Georgia, South Carolina, and West Virginia fell between 1940 and 1950 but rose again between 1950 and 1960. If one realizes that the true incidence of death is, eventually, 100 per cent, it becomes evident that the annual death rate will increase for an aging population even though there is no increase in basic mortality. Therefore, it is possible that the apparent increase between 1950 and 1960 in North Carolina and these other states is a function of increasing average age of the population only rather than any reversal during 1950-60 of a trend toward improved health in 1940-50. It is possible to adjust, by statistical means, the annual death rates for the changing age composition of a population, arriving at the age-adjusted death rate. This has been done in Table IV-C and it can be seen that the application of this adjustment results in a steady improvement in each decade for North Carolina and for all of the other states shown. North Carolina and Virginia show comparable adjusted rates, better than several of the states listed including

TABLE IV-C

AGE ADJUSTED DEATH RATES
(Deaths per 100,000 population)

	<u>1940</u>	<u>1950</u>	<u>1960</u>
United States	1077.2	881.5	811.5
South Atlantic Region	1200.5	928.8	852.7
NORTH CAROLINA	1122.3	883.9	861.8
Delaware	1146.1	993.4	875.7
D. C.	1332.2	1025.8	982.7
Florida	1217.4	868.4	769.1
Georgia	1213.2	948.3	890.5
Maryland	1218.4	952.4	883.0
South Carolina	1322.4	1002.1	948.5
Virginia	1218.2	950.5	860.4
West Virginia	1063.5	887.2	824.7
Other States			
Alabama	1243.1	933.3	874.6
Kentucky	1085.0	893.6	827.5
Minnesota	901.7	792.5	727.0
Mississippi	1225.5	979.1	899.3
New Mexico	1213.8	931.3	792.0
Tennessee	1125.0	898.0	820.4
Texas	1085.5	843.8	767.2
Vermont	1062.3	862.1	840.7
Washington	1012.3	822.1	759.4

Source: Grove, R.D. and A.M. Hetzel. Vital Statistics Rates in the United States 1940-1960. U.S. Dept. of H.E.W., Public Health Service, Washington, D.C.:1968.

Georgia, Maryland, and South Carolina, but higher than Florida, and West Virginia. These gross indices are difficult to interpret in any specific fashion. It is clear that the adjusted death rate is continuing to fall in North Carolina as elsewhere in the U.S. but the factors responsible for the level in any given state are not well enough understood to allow any additional conclusion at this time.

2. Infant Mortality (Table IV-D).

Table IV-D which is simply a more extensive version of Table IV-A, shows that infant mortality for whites in North Carolina improved between 1960 and 1968 and, at 20.9 per 1000 live births in 1968 is not as low as it is in several states but is still improving. Since, as has been pointed out, this figure is closely related to family income, it allows no direct conclusion about medical care. There has been remarkable improvement since 1960 in the mortality rate for non-white infants. In 1960, North Carolina was the highest in the region at 52.4 per 1000. At 38.7 per 1000 in 1968, it is much closer to the mean for the region although it is clear that there is much room for improvement

TABLE IV-D

INFANT DEATH RATES
(Deaths per 1,000 live births)

	<u>1960</u>		<u>1968</u>	
	<u>White</u>	<u>Other</u>	<u>White</u>	<u>Other</u>
United States	22.9	43.2	19.2	34.5
South Atlantic Region	23.6	47.2	19.6	36.2
NORTH CAROLINA	22.3	52.4	20.9	38.7
Delaware	17.8	50.6	16.0	37.3
D. C.	29.4	39.6	16.6	27.7
Florida	23.6	46.1	19.8	36.5
Georgia	24.6	48.1	19.4	37.6
Maryland	22.3	44.6	17.9	33.3
South Carolina	23.9	48.5	20.5	37.4
Virginia	24.6	45.5	18.7	36.2
West Virginia	24.8	37.7	22.4	42.3
Other States				
Alabama	24.9	45.0	20.9	37.7
Kentucky	26.0	48.3	21.0	31.5
Minnesota	21.6	22.6	18.1	26.8
Mississippi	26.6	54.3	22.9	48.1
New Mexico	30.9	52.8	22.3	33.5
Tennessee	25.3	43.5	19.8	35.8
Texas	26.3	43.9	19.8	35.6
Vermont	24.2	0	19.8	0
Washington	22.7	36.7	19.0	28.6

Source: Statistical Abstract of the U.S., 93rd Edit., 1972.

in this parameter which bears little relationship to medical care.

3. Rejection for Military Draft (Table IV-E). This particular index probably sheds the most light on the health status of a segment of the population. Rejection or acceptance for the draft is based upon physical and psychological evaluation of each individual included in the survey and hence, this statistic is particularly useful in assessing the total effects of social, economic, and medical factors within a population. As is shown in Table IV-E, there is a considerable state and regional variation in the percentage of draftees examined and found medically disqualified. North Carolina's record has been consistent, with less variation from year to year than any other state listed and the record of North Carolinians has been outstandingly good.

4. Summary. This comparative summary of selected health statistics indicates that North Carolina is not in the midst of a health crisis. These indices, despite their limitations, are the best now available and indicate that past progress in improving health of North Carolinians and the

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TABLE IV-E
PERCENT OF SELECTIVE SERVICE DRAFTEES
EXAMINED FOR MILITARY SERVICE AND
FOUND MEDICALLY DISQUALIFIED

	<u>1968</u>	<u>1969</u>	<u>1971</u>	<u>Change 1968-1971</u>
United States	30.3	33.2	40.9	+10.6
South Atlantic Region	24.4	26.7	34.9	+10.5
NORTH CAROLINA	22.9	23.6	24.3	+ 1.4
Delaware	25.7	28.3	39.3	+13.6
D. C.	26.5	31.1	44.4	+17.9
Florida	28.0	32.0	40.1	+12.1
Georgia	22.5	21.9	28.8	+ 6.3
Maryland	32.0	32.8	49.0	+17.0
South Carolina	16.5	16.2	27.1	+10.6
Virginia	23.1	26.1	33.4	+10.3
West Virginia	29.1	34.6	37.9	+ 8.7
Other States				
Alabama	28.5	25.4	27.0	- 1.5
Kentucky	27.9	34.2	44.1	+16.2
Minnesota	31.7	34.4	40.8	+ 9.1
Mississippi	18.4	23.2	28.8	+10.4
New Mexico	22.8	22.6	40.4	+17.6
Tennessee	25.9	30.3	37.1	+11.2
Texas	32.9	34.8	36.7	+ 3.8
Vermont	33.3	42.6	44.0	+10.7
Washington	32.4	41.7	46.0	+13.6

Source:

United States Bureau of the Census, Statistical Abstract of the United States: 1969. Washington, D.C. 1969.

United States Bureau of the Census, Statistical Abstract of the United States: 1970. Washington, D.C. 1970.

United States Bureau of the Census, Statistical Abstract of the United States: 1972. Washington, D.C. 1972.

status achieved are quite comparable to and, in certain instances, better than those for the U.S. as a whole and many states in the South Atlantic Region. Differences in infant mortality among whites and non-whites is narrowing slowly but continues to mirror the U.S. experience. This emphasizes that improvement in all of these general purpose vital statistics is a summary expression of total social and economic growth of which medical care, per se, is a relatively minor component. The figures do not reflect the impact of medical care in the past nor do they have predictive value for the demand for care in the future. They are of little use in planning for medical care or the supply of health manpower.

Future improvements in these vital statistics will come only from a deliberate emphasis upon programs providing for continued economic and social development in the broadest sense, including, but not limited to, better housing, better sanitation, better nutrition, better education of each citizen in healthful practices, better working conditions, etc. The provision of adequate resources to sustain these programs should command high priority in state and local planning.

Greater accessibility of medical care, more clinics and hospital facilities, more physicians, nurses and other health professionals, no matter how desirable and necessary and no matter how much in public demand they may be, can never substitute for these broader determinants of the health of the population.

C. Some Tentative Conclusions.

1. Despite the limitations of the health statistics that have been collected over the years, the health status of North Carolinians compares favorably with that of the U.S. at large, with the region, and with other states.

2. The available information on health status does not provide a basis for future projections of demands for medical care or health manpower needs, including numbers of physicians.

3. Historically, availability of medical care has not been a major determinant of improvements in health as measured by vital statistics. There is no reason to believe that new and expanded programs of medical care will materially affect these health indices in the future. Great caution should be used in citing these indices as a rationale for improving medical care or in claiming that more

medical care will be reflected in significant changes in these figures.

4. Finally, the multiple determinants of a population's health means that government at the national, state, and local level must select priorities and allocate resources carefully to a wide range of programs, many of which are only remotely related to medicine, if there is to be sustained improvement in the health of the citizens.

5. The discussion in this section is not intended to convey the idea that we give low priority or that we think that North Carolina should give low priority to improving medical care in all regions of the state. To the contrary, we give this need a very high priority and it is clear that it is one of the foremost concerns of the state's citizens and elected officials. An increase in the number of physicians and an improvement in the distribution of physician services are essential to any such upgrading of medical care. However, because state resources are not unlimited and because many other programs are essential to improving and sustaining health, the rest of this report explores several alternatives for accomplishing an expansion of physician services in an attempt to arrive

at recommendations as to how this may be done most effectively, most economically, in the shortest time, and with the greatest assurance of lasting results.

V. THE SUPPLY OF PHYSICIANS

"The layman is convinced that there are too few physicians. This belief often derives from waiting months for an appointment and then sitting for hours in the waiting room. He may have difficulty in finding a family physician or pediatrician, particularly one who will come to the home. He hears of towns that lack a physician despite new facilities and guarantees of income.

"What to the layman constitutes irrefutable evidence of a shortage of physicians may be interpreted differently: that physicians organize their office hours poorly; that a patient is better seen at a well-equipped center than at home; and that some towns may be less attractive to live in than others."

--B. Senior and B.A. Smith
(Journal American Medical Association,
Vol. 222, p. 178, Oct. 9, 1972.)

It is the purpose of this section to review the pertinent information about physician manpower in the U.S. and in North Carolina in terms of the total number of physicians, of the geographic distribution of physicians, and of the distribution of physicians by type of practice and by specialty. These subjects have been covered in considerable detail in several recent, excellent North Carolina

publications* and it would serve no useful purpose for us to do more than summarize selectively some of the data from these studies and analyses at this juncture. Indeed, we really cannot improve materially upon the summary of these data provided in the Report of the Special Committee of the Board of Governors. We have attempted, however, to give point and emphasis to those aspects of the situation that seem amenable to modification by action at the

*Data and Procedures, First Biennial Report,
Research and Evaluation Division, North Carolina
Regional Medical Program, 1968.

Report of the Committee on the Physician
Shortage in Rural North Carolina, North Carolina
Legislative Research Commission, 1969.

Report of the Subcommittee on Medical
Students and Manpower, North Carolina Joint
Conference Committee on Medical Care, 1972 (The
Glasson Report).

Documentation of the Physician Shortage,
prepared by the Administration of the Medical
School of East Carolina University (xerox
typescript), given to the Panel in April, 1973).

Report of the Committee to Study the Request
of East Carolina University for a Second Year of
Medical Education, Board of Governors, University
of North Carolina, Dec. 29, 1972.

state level. We have drawn conclusions, based upon our collective knowledge and experience, that the Special Committee was either unable or unwilling to agree upon in its report and these conclusions form the basis for our recommendations.

A. Total Number of Physicians Needed.

Despite the widespread feeling and belief that there is a shortage of physicians in the U.S., there exist virtually no generally applicable criteria for assessing the shortage in useful quantitative or qualitative terms. There are no established norms for physician need or demand in a given population. The usual method for expressing medical manpower is the physician/population ratio, expressed as the number of physicians per 100,000 population in a given area. This common formula, however, provides only the crudest index of physician manpower or the adequacy of medical services. As F.G. Dickinson* has put it:

"The population physician ratio . . . reminds one of attempts to measure supply and demand by counting buyers and sellers."

*Quoted in Fein, R.: The Doctor Shortage: An Economic Analysis, p. 62, The Brookings Institution, Washington, D. C., 1967.

Furthermore, as Rashi Fein* has pointed out, the physician/population ratio:

"...does not measure physicians services,....does not attempt to include an adjustment for quality,.... treats all physicians as equal, or, if focused on a particular specialty as if all members of that specialty are homogeneous,....and ignores changes in productivity and in medicine itself."

Other shortcomings of this method of measurement include its failure to portray the geographic distribution of physicians, the proportion of physicians whose services are unavailable to the general public because they are in training programs, research, administration or teaching, or such important information as the relative ages of physicians in urban and rural areas.

The several studies of the nation's supply of physicians that have been carried out during the past 20 years have relied upon the physician/population ratio as an index and have come up with highly variable conclusions, none of which is entirely convincing. Most of these studies have made projections based upon one of two sets of data which are taken as rough norms or approximations of the

*Ibid, p. 63.

desirable ratio for the future. The first of these is an evaluation of the number of physicians required in a few organized medical groups providing prepaid services to sizeable, well-defined populations of subscribers. Projections, on this basis, of manpower figures applicable to the present pluralistic system under which physician services are made available to most of the nation have obvious shortcomings. The second basis for projection has been the physician/population ratio of the northeastern section of the U.S., the principal assumption being simply that since other geographic areas exhibited a lower ratio, more physicians were needed in those areas. This method of projection, of course, established nothing that resembles a norm. It fails completely to consider the easily ascertainable fact that most states in the northeast are just as concerned and preoccupied with the "physician shortage" as are those in the rest of the country. For example, in the state of New York* which has the highest

*Parker, R.C., Rix, R.A., and Tuxill, T.G., Social, Economic, and Demographic Factors Affecting Physician Population in Upstate New York, N.Y. State Journal of Medicine, Vol. 68, pp. 706-712, March, 1969.

physician/population ratio (222/100,000 in 1967) the shortage of physicians in urban ghettos is desperate and the shortage in rural upper New York State is reminiscent of that in eastern North Carolina. Similarly, Connecticut* with the fifth highest physician/population ratio in the nation (186/100,000 in 1967) shows wide discrepancies in availability of physician services, the physician manpower situation in the northwestern part of the state being similar to that in Alaska (74/100,000).

A very obvious consequence of using this method of calculation is that many states now planning programs to increase physician manpower have set as goals: (a) the increase of the physician/population ratio to something approaching the "national average;" or, (b) assuring that the state gets its "fair share" of the national pool of physicians.

1. Past Studies of U.S. Physician Needs.

Table V-A summarizes the conclusions of most of the major studies of the nation's physician manpower needs during the past 20 years and illustrates the variability of the predictions and projections that have resulted.

*Hirakis, S.S. and Armondino, N.L., Distribution of Physicians in Connecticut, Connecticut Health Bulletin, Vol. 86, No. 5, pp. 135-144, May, 1972.

Ideally, of course, estimates of the physician deficit in the U.S., a state, or a region should be based either on calculations of medical need or an estimate of future demand.

TABLE V-A

SUMMARY OF REPORTS ON THE U.S. PHYSICIAN SHORTAGE*

<u>DATE</u>	<u>STUDY GROUP</u>	<u>PROJECTED NEEDS</u>	<u>BASIS FOR PROJECTION</u>
1. 1953	President's Commission on the Health Needs of the Nation (1)	For 1960, US needs: 7,000 more	To maintain the 1940 physician-population ratio of 133 per 100,000.
		11,000 more	To maintain the 1949 physician-population ratio of 135 per 100,000.
		24,000 more	To maintain the 1949 ratio and also meet projected military needs.
		43,000 more	To have one private physician per 1,000 civilian population and maintain 1949 levels in hospitals, schools and military.
		35,000 more	To bring all geographical areas with low physician-population ratios up to the national average
		62,000 more	To bring all geographical areas up to a ratio of 166 physicians per 100,000 population.
			All estimates based on projected 1960 population of 171,176,000.

*Adapted from Senior and Smith, op. cit.

(1) Building America's Health, vol. 2, President's Commission on the Health Needs of the Nation, pp. 183-185, 1953.

<u>DATE</u>	<u>STUDY GROUP</u>	<u>PROJECTED NEEDS</u>	<u>BASIS FOR PROJECTION</u>
2. 1959	Surgeon General's Consultant Group on Medical Education (2) (The Bane Committee)	Need to graduate 3,600 more per annum	To maintain the 1959 physician-population ratio of 141 per 100,000 through 1975. Estimated 1975 population - 235,246,000.
3. 1965	President's Commission on Heart Disease, Cancer, and Stroke (3)	Existing shortage of 20,000 physicians. Need to graduate 1,000 more per annum and increase to 1,300 more by 1975 to raise total by 57,000.	Based on standard of one private physician per 1,000 civilian population. To maintain the 1965 physician-population ratio of 149 per 100,000. Based on estimated 1975 population of 230,000,000.
4. 1967	Task Force on Health Manpower (4)	Existing shortage of 35,900 physicians. Need for 54,800 more by 1975.	To bring every low state's physician-population ratio up to the national average. To maintain the 1965 physician-population ratio of 153 per 100,000. Based on estimated 1975 population of 232,221,000.
(2)	Physicians for a Growing America, Public Health Service Publication 709. Surgeon-General's Consultant Group on Medical Education, pp. 1-13, 1959.		U.S. Dept. of HEW,
(3)	A National Program to Conquer Heart Disease, Cancer, and Stroke. Report to the President. pp. 273-287, 1964-65.		President's Commission on
(4)	Action to Meet Community Needs. Task Force on Health Manpower, National Commission on Community Health Services, Health Manpower, pp. 37-47, Public Affairs Press, 1967.		

<u>DATE</u>	<u>STUDY GROUP</u>	<u>PROJECTED NEEDS</u>	<u>BASIS FOR PROJECTION</u>
5. 1967	U.S. Public Health Service (5)	Existing shortage of 53,000 physicians in 1966. Need for 103,000 more by 1975.	Based on standards of 100 physicians exclusive of hospital staff per 100,000 population, which is average ratio of prepaid group practice plans.
6. 1967	National Advisory Commission on Health Manpower (6)	Shortage exists because physician productivity is not keeping pace with demand for services. Future needs will depend on improvements in health-care system and physician productivity.	No numerical standard given for number of physicians in population.
7. 1970	Carnegie Commission on Higher Education (7)	Existing shortage of 50,000. Increase medical school entrants by 52% by 1978.	Quotes Dr. Roger Egeberg To achieve physician-population ratios of 161.4 per 100,000 by 1977 and 216.4 per 100,000 by 2002.
(5)	<u>Health Manpower Perspective: 1967</u> , Public Health Service Publication 1667. U.S. Dept. of HEW, Bureau of Health Manpower, pp. 9-14, 1967.		
(6)	<u>Report of the National Advisory Commission on Health Manpower</u> , U.S. Govt. Printing Office, Washington, D. C., 1967.		
(7)	<u>Carnegie Commission on Higher Education: Higher Education and the Nation's Health</u> , McGraw-Hill Book Co., Inc., New York, 1970.		

<u>DATE</u>	<u>STUDY GROUP</u>	<u>PROJECTED NEEDS</u>	<u>BASIS FOR PROJECTION</u>
8. 1971	National Fund for Medical Education (Millis Report) (8)	50,000 additional physicians needed; 50 per cent increase in medical school enrollment by 1975.	Seems realistic in view of previous studies and the uncertainties of any more exact calculation.

- (8) Millis, John S., A Rational Public Policy for Medical Education and Its Financing; A Report to the Board of Directors, the National Fund for Medical Education, pp. 42-45, New York, 1971.

a. Predictions based on medical need are confounded because:

--U.S. physician/population ratios already exceed those in countries alleged or conceded to have better health care as well as those of large, prepaid medical care plans in the U.S. which give good care in organized, "non-traditional" ways.

--Recent experience and analysis suggests strongly that, in the absence of massive reorganization of the present pluralistic system for providing medical care (an unlikely contingency within the near future) the introduction of an additional number of physicians will: (1) Aggravate the already existing geographic and socio-economic imbalance and inequity of medical services, thus increasing rather than decreasing public dissatisfaction; and (2) engender even greater overall costs for medical care both by the professional fees charged and the expenses of the additional diagnostic and therapeutic procedures which they perform or initiate.*

*The following references have been selected from an extensive literature on this subject:

Fein, R., op. cit.

Senior, B. and Smith, B.A., op. cit.

U.S. Dept. of HEW, Personal Health Expenses: Per Capita Annual Expenses, U.S., July-December, 1962, Vital and Health Statistics, Series 10, No. 27, 1966.

Stevens, C.M., On "Consumer Participation" in Medical-Care Markets, Health Care Policy Discussion Paper Senis, No. 5, Center for Community Health and Medical Care, Harvard University, Boston, April, 1973.

Boulding, K.E., The Concept of Need for Health Services, The Milbank Memorial Fund Quarterly, Health Services Research II, part II, pp. 203-204, Oct., 1966.

Arrow, K.J., Uncertainty and The Economics of Health Care, The American Economic Review, p. 951, December, 1963.

Fuchs, V. and Kramer, M.J., Determinants of Expenditures for Physicians' Services in the United States 1948-68, National Bureau of Economic Research, Occasional Paper 117, Dept. of HEW. Publication No. (HSM) 73-3013, December 1972.

Fein, R., *op. cit.*

Grossman, M., The Demand for Health: A Theoretical and Empirical Investigation, National Bureau of Economic Research, New York, 1972.

Feldstein, M.S., The Rising Price of Physicians' Services, The Review of Economics and Statistics, Vol. 52, pp. 121-133, May, 1970.

Klarman, H., Economic Aspects of Projecting Requirements for Health Manpower, Journal of Human Resources, Vol. 4, pp. 360-376, (Summer) 1969.

Klarman, H., Rice, D., Cooper, B., and Stettler, L., Sources of Increase in Expenditures for Selected Health Services, 1929-69, Dept. of HEW, Social Security Administration, Staff Paper No. 4, April, 1970.

Ginzberg, E., Men, Money, and Medicine, Columbia University Press, New York, 1969.

Ginzberg, E., Cautionary View of Medical Care, New England Journal of Medicine, Vol. 262, pp. 367-368, 1960.

b. Predictions based on demand indicate no presently detectable limit except ability to pay. This statement incidentally, applies not only to the public's demands for physicians' services but also to the demand by qualified students for admission to medical school. Since public satisfaction is based upon the ability of any system to deliver services, whether transportation, maintenance of home appliances, or medical care at the rate demanded rather than at a rate which some authority calculates is needed, our present inability to assess the future rates of increase of demand for physician services poses a major difficulty in planning changes that are calculated to assure public satisfaction with the accessibility of physician services. Fundamentally, this difficulty is a political problem but, it is a real and compelling constraint, nonetheless.

c. Other factors affecting predictions
based on both need and demand include:

- Anticipated changes in population.
- Increasing utilization in the U.S. of foreign medical graduates.
- Further sophistication in medicine and the technologies of diagnosis and

therapy and a corresponding increase in the requirements for maintaining professional competence of physicians.

--Rapid diversification of the need for physicians in teaching, administration, research, environmental control, occupational and industrial health, etc.

--The growing mobility of the population, including physicians who, with increasing frequency, change their places of residence and the location of their practices.

2. A Matter of Opinion? - Considering the variable results of past studies of U.S. physician manpower requirements and the complexity and low reliability of assessing either future need or demand as a basis for predicting aggregate needs for physicians, it comes as no surprise that there is vigorous disagreement on the subject of the U.S. physician shortage. As the Special Committee of the Board of Governors* put it:

"Thus, at a time that the public-at-large is expressing the need for more doctors, some authorities in the field are saying that, with the recent substantial increases in the capacities of medical schools, the period of critical nationwide shortage of doctors may be ended by about 1980."

*op. cit.

Expressions of this opinion have been relatively few,* however, and it is only fair to say that those who have drawn this conclusion do not believe that U.S. medical care is adequate or satisfactory. Rather, they emphasize the need to devote attention and resources to increasing the productivity of physicians by more efficient organization of the delivery of care and by use of allied health professionals.

Indeed, the controversial report of the Subcommittee on Medical Students and Manpower of the North Carolina Joint Conference Committee on Medical Care (The Glasson Report)** sounded a similar note. It did not, as it has been represented by some to the Panel to have done, state that no additional physicians are needed in North Carolina. It simply

*Senior, B. and Smith, B.A., op. cit.

Manpower Report of the President, U.S. Dept. of Labor, Washington, D. C., March, 1972.

Dept. of HEW Health Programs Memorandum for FY1975, (document "leaked" to the Senate Subcommittee on Health, reported in Drug Research Reports, "The Blue Sheet," Washington, D. C., Aug. 1, 1973

**op. cit.

expressed the opinion that the expansion of medical education in the state already in process is adequate and emphasized strongly the need to devote efforts and resources to improve "the organization and delivery of medical care and physician productivity and mobility."

3. Physician Manpower Status of North Carolina - The foregoing discussion has emphasized the fact that there are no norms that make it possible to calculate how many physicians is the correct number for a given state or area. In this section, therefore, we will simply show how North Carolina compares with other states and, in the next, how programs already underway can be expected to change North Carolina's status.

Despite the already-stated criticisms of physician/population ratios as only rough approximations of aggregate physician manpower, they remain the only available basis for country-wide comparisons.

Table V-B, taken from a report prepared for the Minnesota legislature,* gives, in rank order,

*Report of the Interim Committee on Medical Education to the Minnesota Senate, 66th Session of the Minnesota Legislature, St. Paul, Minn., April 10, 1969.

TABLE V-B

PHYSICIAN-POPULATION RATIOS
RANKED BY STATE (1967)
(Rate per 100,000 population)

Rank	State	Rate	Rank	State	Rate
1	New York	222	26	Nebraska	121
2	Massachusetts	208	27	Iowa	120
3	Colorado	191	28	Kansas	119
4	Vermont	190	29	Oklahoma	119
5	Connecticut	186	30	Virginia	119
6	California	184	31	Texas	118
7	Maryland	177	32	Tennessee	117
8	Rhode Island	164	33	Louisiana	113
9	Pennsylvania	161	34	Nevada	109
10	Florida	160	35	New Mexico	107
11	Washington	156	36	Montana	105
12	MINNESOTA	151	37	North Carolina	105
13	Missouri	150	38	Georgia	104
U.S. 14	Michigan	148	39	West Virginia	104
15	Oregon	147	40	Wyoming	104
16	Arizona	146	41	Indiana	103
17	Hawaii	146	42	Kentucky	101
18	New Jersey	145	43	Idaho	97
19	New Hampshire	142	44	North Dakota	93
20	Delaware	141	45	Arkansas	87
21	Ohio	141	46	South Dakota	86
22	Illinois	139	47	South Carolina	84
23	Utah	134	48	Alabama	82
24	Maine	129	49	Mississippi	76
25	Wisconsin	125	50	Alaska	74

SOURCE: U.S. Dept. H.E.W.; Public Health Service: Health Manpower In The United States: 1965-1967, PHS Publication No. 1000, Series 14, No. 1. Washington: G.P.O., December 1968. Pages 17,18.

the physician/population ratios for the 50 states in 1967. There have been no significant changes in the figures since that time. North Carolina ranked 37th with 105 physicians/100,000, Virginia ranked 30th with 119, South Carolina was 47th with 84, and Tennessee ranked 32nd with 117. The corresponding figures for 1970, obtained by the Special Committee of the Board of Governors, were: North Carolina 103.1; Virginia 119.1; South Carolina 85.1; and Tennessee 113.5; Table V-C, also taken from the Minnesota report, was constructed to illustrate "the limited and sometimes misleading effect of the aggregate physician/population ratio." In this table, ratios have been recalculated excluding physicians in training as interns or residents and the states ranked accordingly. In this analysis, North Carolina goes from 37th to 43rd, Virginia from 30th to 32nd, South Carolina from 47th to 46th, and Tennessee from 32nd to 37th.

Clearly, there is much room for improvement in North Carolina's comparative standing in these rough rankings of available physician manpower.

TABLE V-C

PHYSICIAN-POPULATION RATIOS
(EXCLUDING PHYSICIANS IN TRAINING)
RANKED BY STATE (1967)

Rank	State	Rate	Rank	State	Rate
1 (1)	*New York	180	26 (34)	Nevada	109
2 (2)	Massachusetts	173	27 (25)	Wisconsin	109
3 (3)	Vermont	170	28 (27)	Iowa	107
4 (3)	Colorado	166	29 (29)	Oklahoma	107
5 (6)	California	161	30 (36)	Montana	105
6 (5)	Connecticut	159	31 (40)	Wyoming	104
7 (10)	Florida	145	32 (30)	Virginia	103
8 (7)	Maryland	140	33 (28)	Kansas	102
9 (8)	Rhode Island	139	34 (31)	Texas	102
10 (11)	Washington	139	35 (35)	New Mexico	99
11 (16)	Arizona	137	36 (43)	Idaho	97
12 (9)	Pennsylvania	137	37 (32)	Tennessee	97
13 (18)	New Jersey	132	38 (41)	Indiana	95
14 (19)	New Hampshire	131	39 (39)	West Virginia	95
15 (15)	Oregon	131	40 (33)	Louisiana	93
16 (20)	Delaware	130	41 (44)	North Dakota	91
U.S. 17 (24)	Maine	126	42 (42)	Kentucky	90
18 (13)	Missouri	125	43 (37)	North Carolina	90
19 (14)	Michigan	124	44 (38)	Georgia	89
20 (21)	Ohio	119	45 (46)	South Dakota	84
21 (17)	Hawaii	118	46 (47)	South Carolina	79
22 (22)	Illinois	116	47 (45)	Arkansas	78
23 (12)	MINNESOTA	115	48 (48)	Alabama	74
24 (23)	Utah	115	49 (50)	Alaska	74
25 (26)	Nebraska	109	50 (49)	Mississippi	70

SOURCE: Ibid., pages 17,18. American Medical Association, Directory of Approved Internships & Residencies, 1967-68. Chicago: AMA, 1967. Pages 6, 12.

*Numbers in parenthesis indicate rankings of states in Table V-B.

4. An Estimate of North Carolina's Physician Manpower in 1980 on the Basis of Programs Already Underway. It is the purpose of this section, on the basis of present trends and programs intended to increase the total number of physicians in the state, to calculate the changes in North Carolina's supply of practicing physicians by 1980. For purposes of clarity, we have not broken down these projections in terms of North Carolina residents or non-residents although in a later section of this report, we take up this subject specifically (See Section VI). We have obtained the data used in these calculations from several sources and we are convinced that they are sufficiently accurate for this type of projection.

a. Status in 1970 - In North Carolina, in 1970, there were 4,647 physicians engaged in patient care. This number excludes interns, residents, retired, administrative, and military physicians. It includes the members of the clinical faculties of the three medical schools, since they are not transients and are involved in the care of patients.

The population of the state in 1970 was 5,082,059.

The physician/population ratio in 1970 was, therefore, 91.5 physicians/100,000 (note that this figure compares with 90/100,000 calculated in Table V-C for 1967).

b. Annual Attrition - According to the North Carolina State Board of Medical Examiners, the attrition rate for practicing physicians averages 61 per year, 27 by death and 34 by retirement, migration, or other causes.

c. Annual Accession of New Physicians Practicing in North Carolina. These individuals will continue to come from three sources, two major and one minor.

(1) Graduates of North Carolina Medical Schools. We have projected an average of three years of postgraduate (internship and residency) training beyond the M.D. for all graduates, meaning that new physicians will enter practice on the average of 7 years after entering medical school. This assumes that the "doctor-draft" is over and will not be reinstituted. We have also used the average return to the state for the practice of medicine ("retention rates") as determined in the American Medical Association Alumni Study in 1968 for

graduates of UNCCH, Duke, and Bowman-Gray. We have used the actual enrollments of these three schools up through 1973 since the 7 year lag period means that the class that enters school this year will be returning to practice in the state in 1980. None of these calculations, therefore, is based upon projected but not yet implemented enrollment increases planned beyond 1973. The impact of these planned increases upon the number of practicing physicians in the state will not be felt until beyond 1980. These calculations give a figure of 1,228 additional physicians in practice in North Carolina by 1980 from the graduates of the three medical schools between 1967 and 1977.

(2) Graduates of Medical Schools outside of North Carolina. The American Medical Association Alumni Study in 1968 showed that an average of 1.28% of medical graduates from schools outside of North Carolina eventually settle and practice in North Carolina. This has been very consistent in the past and, while it may be expected to increase modestly, we have applied it strictly in this projection, using the very conservative figure of 95,000 total M.D. graduates of schools outside

of North Carolina for the period 1967-77. This calculation gives a figure of 1,215 additional physicians in practice in North Carolina by 1980 from graduates of schools outside the state.

(3) Foreign Medical Graduates.

Under the current, relatively stringent licensing requirements of the state, approximately 20 graduates of foreign medical schools have been added to the pool of practicing physicians in North Carolina each year. We have simply projected this figure to indicate a total of 200 additional physicians during the decade.

d. Status in 1980 - Totalling these accession figures gives an estimate of 2,443 new physicians which, when reduced by the expected attrition of 610 derives a net gain of 2,033 more physicians in practice in North Carolina for a total of 6,680 by 1980. Population projections* for 1980 range from a low of 5,588,000 to a high of 6,048,000. This would mean a physician/population ratio of 110 to 119/100,000 by 1980, an obvious improvement over the 1970 figure of 91.5/100,000.

*Steahr, T.E.: North Carolina's Changing Population, Carolina Population Center, UNCCH, p. 98, 1973.

Another way of looking at these projections is to say that while the general population will be increasing at about 1 per cent per year, the number of physicians in practice will be increasing at almost 3 per cent per year.

e. Some Conclusions from This Projection -

It is important to emphasize certain aspects of these calculations.

--They include only physicians in practice.

--They allow for a lag-period of 7 years between entry into medical school and entry into practice. This is much more realistic than counting M.D. degrees in the year that they are awarded as representing additions to the state's physician manpower.

--From now until 1980, the major source of new physicians (excluding foreign medical graduates) will be from the pool of students already enrolled in or recently graduated from medical school. In other words, the size of the manpower pool to be drawn upon or for which North Carolina must "compete" has already been determined with the entry of the new class in the fall of 1973 since these students will be entering practice in 1980.

--This leads to the conclusion that any additional effort to increase the production of new M.D.'s in North Carolina or, indeed, in the nation, after the fall of 1973, can be expected to begin to yield results, in terms of additional numbers of physicians in practice only in the years after 1980.

All of these considerations point to the fact that any significant increase in these projections for physician manpower in North Carolina by 1980 must come about by efforts other than an expansion of enrollment in medical schools. Possible efforts include:

- Improving "retention rates" of graduates of North Carolina medical schools;
- Better recruitment, through various mechanisms, of graduates of medical schools outside the state or new M.D.'s now completing their residency training in North Carolina or outside of the state;
- A reconsideration of the regulations governing licensing of foreign medical graduates to practice in North Carolina.

This projection, then, illustrates the long-term nature of expanded programs of medical education as a mechanism for alleviating the physician shortage since their impact will not be apparent until after 1980.

Furthermore, this projection demonstrates the crucial importance to North Carolina of according high priority to various forms of recruitment of additional physicians into the state in the years immediately ahead if there is to be any appreciable improvement, beyond that now projected, in the

state's supply of practicing physicians during the rest of the decade of the 1970's.

Clearly, these considerations have played an important part in helping us to frame our recommendations.

B. The Geographic Distribution of Physicians.

The most difficult and persistent of all physician manpower problems is not the total number of physicians but the uneven and, some say inequitable, geographic distribution of physicians and their services. This knotty problem is worldwide and currently is being confronted by every state in the nation. In its simplest terms, it boils down to the difficulty of getting physicians to practice in urban slums and, more pertinent to North Carolina, in rural areas. Our discussion will be limited to rural practice.

Perhaps no aspect of physician manpower has been subjected to more intensive survey and analysis. There are literally reams of data available for North Carolina and for other states which show generally:

--That while urban and suburban areas are tending to improve their physician/population ratios, many rural areas show a steady deterioration in this index.

--That as established rural practitioners retire or die, they are not being replaced by new physicians.

--That the average age of rural physicians is considerably higher than that of physicians in other areas, boding ill for the future.

This summarizes the present picture despite strenuous efforts by small communities to attract replacement or additional doctors by offering guarantees of income and housing, and constructing and equipping attractive offices and clinics which are offered rent-free or at very modest rates. Rural America and rural North Carolina are dotted with small towns in which such facilities stand empty. The problem exists in many states.*

*See, for example:

Parker, R.C., Rix, R.A. and Tuxill, T.G., op. cit. (New York).

Hirakis, S.S. and Armondino, N.L., op. cit. (Connecticut)

Report of the Interim Committee on Medical Education to the Minnesota Senate, op. cit.

Weiskotten, H., Wiggins, W., Altenderfer, M., Gooch, M., and Tipner, A., An Analysis of the Distribution and Characteristics of Medical School Graduates, 1915-1950, Journal of Medical Education, Vol. 35, pp. 1071-1121, 1960.

Mountin, J., et al, Location and Movement of Physicians, 1923 and 1938, Public Health Reports, Vol. 57, 1942.

Marden, P., A Demographic and Ecological Analysis of the Distribution of Physicians in Metropolitan America, 1960, American Journal of Sociology, Vol. 72, pp. 290-300, 1966.

Murray, R.H.: Medical Manpower in Indiana, Journal of the Indiana State Medical Association, Vol. 65, pp. 1259-1261, 1972.

Petersen, G.R., A Comparison of Selected Professional and Social Characteristics of Urban and Rural Physicians in Iowa, (Health Care Research Series No. 8) University of Iowa, Iowa City, 1968.

Cooper, J.K., Heald, K., and Samuels, M., The Decision for Rural Practice, Journal of Medical Education, Vol. 47, pp. 939-944, 1972.

Crawford, R.L. and McCormack, R.C.: Reasons Physicians Leave Primary Practice, Journal of Medical Education, Vol. 46, pp. 263-268, 1972 (Virginia).

Bible, B.L.: Physicians' Views of Medical Practice in Nonmetropolitan Communities, Public Health Reports, Vol. 85, pp. 11-17, 1970.

Beck, J.D. and Gernert, E.B., Attitudes and Background Values as Predictors of Urban-Rural Practice Locations, Journal of Dental Education, Sept., 1971, pp. 573-581 (Dentists in Kentucky).

Champion, D.J., Who Practices Where, and Why? Surprise in Appalachia, Medical Opinion and Review, Vol. 6, pp. 26-29, 1970 (Tennessee).

Champion, D.J. and Olsen, D.B., Physician Behavior in Southern Appalachia: Some Recruitment Factors, Journal of Health and Social Behavior, Vol. 12, 1971.

There exist numerous empirical studies on the factors influencing the location of physicians in practice and the incentives and disincentives to rural practice are reasonably well catalogued. As the Special Committee of the Board of Governors* put it:

"There is persistent tendency of physicians to congregate in certain places and to avoid others."

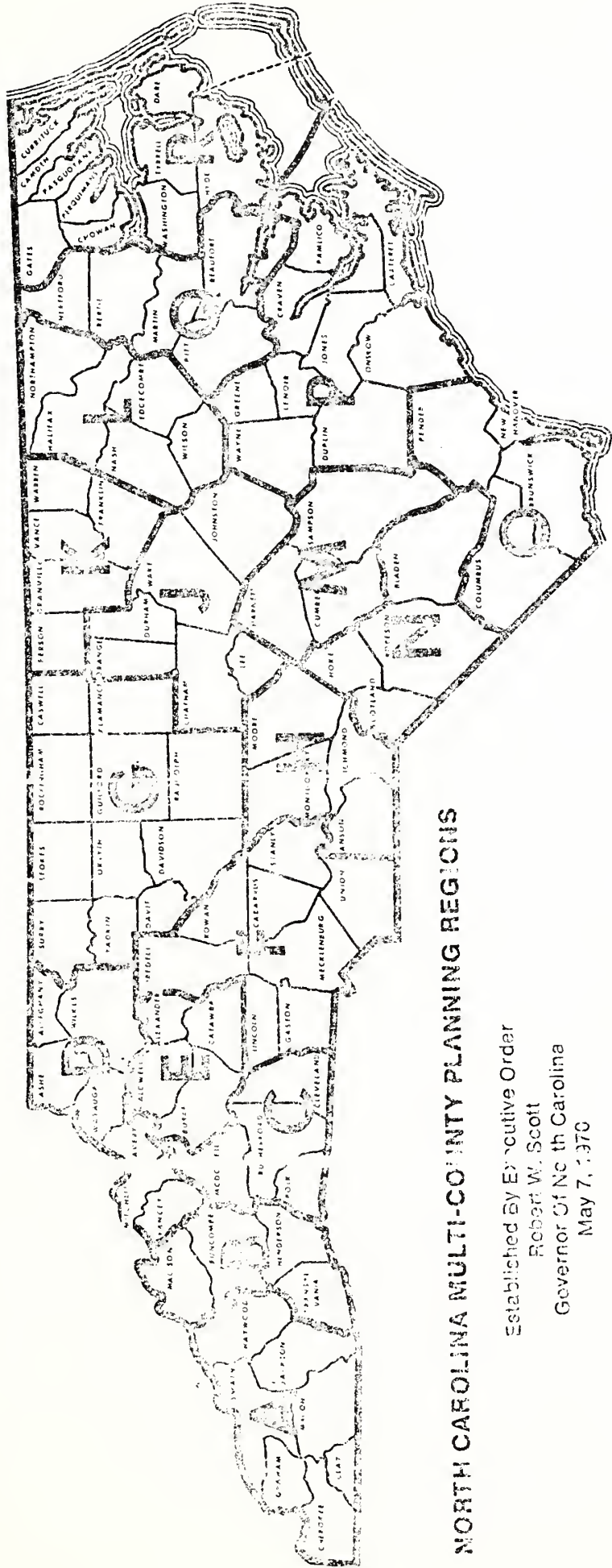
We cannot improve on this statement of the problem.

It is the purpose of this section to summarize the existing distribution problem in North Carolina, to examine the known factors influencing distribution of physicians, and to single out those favoring rural practice that might be amenable to improvement by action at the state and/or local level.

1. Current Distribution of North Carolina Physician Manpower - In 1970, North Carolina was divided into 17 multicounty planning districts. These are shown in Figure V-1. The

*op. cit.

FIGURE V-1



NORTH CAROLINA MULTI-COUNTY PLANNING REGIONS

Established By Executive Order
 Robert W. Scott
 Governor Of North Carolina
 May 7, 1970

Special Committee of the Board of Governors* analyzed the physician/population ratios in these districts and found, as expected, an enormous variation. Here, we simply repeat their findings. The physician/population ratio for the entire state in 1970 was 103/100,000. "Region J (Chatham, Durham, Johnston, Lee, Orange and Wahr counties) had a ratio of 293.3/100,000; Region D (Allegany, Ashe, Avery, Mitchell, Watauga, Wilkes, and Yancey counties) had 48.7 and Region R (Camden, Chowan, Currituck, Dare, Gates, Hyde, Pasquotank, Perquimans, Tyrell, and Washington counties) had 48.4. Four of the regions that were above the median region are in the Eastern half of the state and four are in the western half. Of the regions below the median, five are in the eastern half and three are in the western half. The figures for each region are summarized in Table V-D which has been reproduced here from the Special Committee's report.

It is difficult to make meaningful comparisons between physician manpower problems in North Carolina

*op.cit.

PHYSICIANS IN NORTH CAROLINA PER 100,000 POPULATION

N.C. Multi-County Planning Regions	Population	Per-Cent Population Change 1960-1970	Physicians	Physicians Per 100,000
<u>Region J</u> - Chatham, Durham, Johnston, Lee, Orange, Wake	540,000	+21.1	1,585	293.3
<u>Region B</u> - Buncombe, Henderson, Madison, Transylvania	223,400	+ 4.2	254	113.8
<u>Region G</u> - Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry, Yadkin	981,100	+12.5	1,011	103.1
<u>Region F</u> - Cabarrus, Caston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, Union	870,100	+18.3	762	87.6
<u>Region O</u> - Brunswick, Columbus, New Hanover, Pender	172,300	+ 4.2	136	79.0
<u>Region E</u> - Alexander, Burke, Caldwell, Catawba	227,000	+14.4	173	76.2
<u>Region Q</u> - Beaufort, Bertie, Hertford, Martin, Pitt	178,500	- 4.0	131	73.4
<u>Region P</u> - Carteret, Craven, Duplin, Greene, Jones, Lenoir, Onslow, Pamlico, Wayne	410,000 <u>-110,100*</u> 299,900	+ 3.8	215	71.7
<u>Region C</u> - Cleveland, McDowell, Polk, Rutherford	162,100	+ 4.4	111	68.5
<u>Region L</u> - Edgecombe, Halifax, Nash, Northampton, Wilson	245,700	- 7.2	165	66.9

TABLE V-D (CONT.)

1	<u>Region H</u> - Anson, Montgomery, Moore, Richmond	121,600	- 2.4	79	65.0
2	<u>Region A</u> - Cherokee, Clay, Graham, Haywood, Jackson, Macon, Swain	115,100	- 0.8	68	59.1
3	<u>Region M</u> - Cumberland, Harnett, Sampson	306,700 <u>-101,913**</u> 204,787	+22.5	120	58.6
4	<u>Region K</u> - Franklin, Granville, Person, Vance, Warren	134,000	- 5.7	78	58.2
5	<u>Region N</u> - Bladen, Hoke, Robeson, Scotland	154,600	- 5.5	87	56.3
6	<u>Region D</u> - Alleghany, Ashe, Avery, Mitchell, Watauga, Wilkes, Yancey	127,300	+ 3.4	62	48.7
7	<u>Region R</u> - Camden, Chowan, Currituck, Dare, Gates, Hyde, Pasquotank, Perquimans, Tyrrell, Washington	97,200	- 3.4	47	48.4

7 Naval hospitals in Onslow and Craven Counties provide medical care for 48,000 active duty, 3,200 retired, and 53,900 dependents of active duty and retired military personnel. Approximately ninety (90) physicians staff these hospitals.

* An Army hospital and other military medical facilities in Cumberland County provide medical care for 36,469 active duty, 3,960 retired, and 61,484 dependents of active duty and retired military personnel. Approximately one hundred (100) physicians staff Womack Army Hospital; an additional fifty (50) physicians serve the 82nd Airborne Division, John F. Kennedy Special Warfare Center, and Pope Air Force Base.

and those in other states. Table V-E, however, in addition to showing aggregate physician/population ratios in the South Atlantic region and other selected states, indicates that North Carolina, at least, has no physicianless counties.

Table V-F is a county-by-county tabulation of physician/population ratios for North Carolina.

It is clear that North Carolina, in common with many other states, suffers from an imbalance in distribution of physicians and physicians' services. The next section discusses the several factors known to influence location of physicians and undertakes to draw conclusions about mechanisms that might be used to ameliorate the problem in North Carolina.

2. Factors Influencing the Location of Physicians in Practice. Empirical studies of the factors that appear to influence the decision of a physician in selecting a location in which to practice have been performed in several states and there have been a few aggregate analyses at the national level. Generally, these surveys have been carried out by analyzing and comparing the responses of a selected sample of "urban" and "rural" physicians

TABLE V-E

PHYSICIAN-POPULATION RATIOS (TOTAL PHYSICIANS
PER 100,000 POPULATION) AND NUMBER OF PHYSICIANLESS COUNTIES

	<u>1963</u>	<u>1967</u>	<u>1971</u>	<u>No. of Counties w/o an M.D. in Patient Care, 1971.</u>
United States	135	145	152	133
South Atlantic Region	127	140	143	21
NORTH CAROLINA	102	107	113	0
Delaware	125	136	139	0
D. C.	460	479	423	0
Florida	117	134	162	4
Georgia	106	111	112	14
Maryland	190	222	192	0
South Carolina	82	90	97	0
Virginia	116	129	129	2
West Virginia	97	102	109	1
Other States				
Alabama	83	87	91	1
Kentucky	97	104	104	3
Minnesota	139	150	151	0
Mississippi	82	82	83	1
New Mexico	95	103	120	3
Tennessee	113	119	122	2
Texas	112	121	119	23
Vermont	151	173	185	0
Washington	141	153	150	0

Source:

Roback, G. A. Distribution of Physicians in the United States, 1971.

Chicago: American Medical Association, 1972.

Theodore, C. N. Selected Characteristics of the Physician Population, 1963 and 1967. Chicago: American Medical Association, 1968.

TABLE V-F PHYSICIAN POPULATION RATIO^a, BY COUNTY, FOR ALL
PHYSICIANS IN ACTIVE PRACTICE, MARCH, 1968

County	Physicians Per 100,000 Population	County	Physicians Per 100,000 Population
NORTH CAROLINA	78		
Alamance	78	Johnston	41
Alexander	23	Jones	87
Alleghany	64	Lee	75
Anson	28	Lenoir	69
Ashe	29	Lincoln	37
Avery	83	McDowell	43
Beaufort	62	Macon	54
Bertie	25	Madison	49
Bladen	28	Martin	36
Brunswick	28	Mecklenburg	106
Buncombe	116	Mitchell	52
Burke	92	Montgomery	42
Cabarrus	75	Moore	94
Caldwell	55	Nash	78
Camden	18	New Hanover	111
Carteret	58	Northampton	31
Caswell	5	Onslow	28
Catawba	83	Orange	451
Chatham	43	Pamlico	10
Cherokee	36	Pasquotank	95
Chowan	60	Pender	22
Clay	39	Perquimans	11
Cleveland	70	Person	28
Columbus	38	Pitt	79
Craven	68	Polk	155
Cumberland	42	Randolph	41
Currituck	29	Richmond	40
Dare	33	Robeson	54
Davidson	38	Rockingham	50
Davie	33	Rowan	61
Duplin	37	Rutherford	55
Durham	275	Sampson	36
Edgecombe	25	Scotland	81
Forsyth	141	Stanly	56
Franklin	35	Stokes	25
Gaston	54	Surry	58
Gates	21	Swain	34
Graham	46	Transylvania	75
Granville	119	Tyrrell	24
Greene	12	Union	37
Guilford	96	Vance	44
Halifax	36	Wake	110
Harnett	43	Warren	16
Haywood	70	Washington	26
Henderson	92	Watauga	68
Hertford	63	Wayne	66
Hoke	51	Wilkes	32
Hyde	17	Wilson	96
Iredell	70	Yadkin	25
Jackson	73	Yancey	37

^aBased upon the July 1, 1967 civilian population obtained from: Estimates of the Population of North Carolina Counties 1966 and 1967, under the direction of C. Horace Hamilton, Ph.D., Statistical Service Center, Budget Division, Department of Administration, State of North Carolina Demographic Report H-1 (May, 1968), pp. 26-28.

to questionnaires or interviews. In some larger studies, the data were collected from public records rather than by direct questioning of physicians. Before summarizing the findings of such studies, we wish to emphasize several points:

--The physician probably has more personal control over the choice of his practice location than almost any other professional. The medical profession is independent and the demand for physician services is uniformly high in all areas, urban or rural. Clearly, the usual economic constraints of supply and demand are not predictive for distribution of physician services.

--The analytic techniques employed in most studies have made it possible only to show the existence (or lack) of "significant" statistical correlations between certain personal, social and environmental circumstances and the physician's decision to locate in a given area. A statistical correlation may imply but does not prove a cause and effect relationship.

--Responses and expressions of preference among individual physicians tend to vary widely. For example, in a survey of rural and urban practice in Iowa,* physicians were asked to indicate, on a list, the biggest problem they had overcome after they had selected a location in which to practice. The problems given in the questionnaire included economic difficulties, professional problems, compatibility with environment, and lack of health facilities. Of 139 physicians responding, 43 per cent indicated that they had

*Peterson, G.L., op. cit.

experienced no problems at all! This surprising result was assumed to arise from the fact that the older, established physician, looking back to the beginning of his practice, doesn't consider the problems he encountered then as being nearly as significant now. In most of our discussions with others in preparing this report, great emphasis has been laid upon the role of the physician's spouse in deciding upon location of practice. However, in a survey of 89 Virginia physicians* who had once been in primary care practice (general practice, internal medicine, pediatrics) but who had subsequently left this type of practice, only two mentioned dissatisfaction on the part of the wife as influencing the decision to change. In another study,** more than one-third of physicians in rural counties indicated that their wives expressed dissatisfaction with community life.

--A frustrating aspect of looking at various studies is the relative infrequency with which the formal effort of a community to attract and recruit a doctor is mentioned by a physician as having influenced significantly his selection of a practice location. Indeed, in the Iowa*** study, none of the physicians queried listed this as a factor although the questionnaire used included this in the list of possible responses to be checked. In another national study in 1967,**** only 4 to 11 per cent of rural physicians indicated that they had found their location through medical society placement services and most of these were doctors who had sought relocation after release from the armed forces after World War II.

*Crawford, R.L. and McCormack, R.C., op. cit.

**Bible, B.L., op. cit.

***Peterson, G.L., op. cit.

****Bible, B.L., op. cit.

--Finally, despite the rather extensive catalogue of major and minor factors that seem to influence location of medical practice, the list includes relatively few circumstances that seem specifically amenable to significant alteration by actions at the national, state, or even the community level.

In looking at the available information on this subject, the Special Committee of the Board of Governors,* classified the influential factors into three categories: the general characteristics of the community; the personal history of the physician, including certain "attachment events" during early life and professional training; and the medical facilities available in or to a community. We have structured our discussion in somewhat the same fashion with a slightly different emphasis.

a. The General Characteristics of the Community.

These include climate, degree of urbanization, recreation facilities, quality of schools, cultural activities, etc. Generally, the available data indicate that some or all of these factors are important to most physicians. It is difficult to rank order or to weight them in any useful fashion

*See the Committee Report, pp. 27-34

and, of course, the list includes many that are difficult or impossible to modify expeditiously or which should be deliberately changed simply for the purpose of attracting physicians. As an essentially rural state with very few large urban foci, and as a state where planning is intended to avoid urban congestion and its accompanying ills in the future, North Carolina has made a conscious choice about its social and economic development. The problem of physician distribution, therefore, must be solved within this larger framework which, by its nature, eliminates many of the factors known statistically to attract physicians into practice. It is, nevertheless, of interest to note that in the Virginia study of doctors who gave up primary care practice,* 58 per cent of the physicians queried described "inadequate cultural and recreational resources" as a major influence upon their decision to change.

Almost all who had been in small towns or rural areas voiced concern about "lack of privacy"

*Crawford, R.L. and McCormack, R.C., op. cit.

when they were not working; in other words, they were never "off-duty." This, of course, points to the importance of group practice or at least informal associations among physicians in an area who can "take calls" for each other. In the Iowa study,* 41 per cent of rural doctors stated that, given the opportunity to start their practices over, they would move to a larger community or to one with a better-equipped hospital. Only 19 per cent of Iowa urban physicians indicated any desire to relocate and in a majority (two-thirds) the expressed preference for change was for a warmer climate.

While it is difficult to visualize state policies, other than fostering regional social and economic development, that can materially or expeditiously modify general community characteristics in such a way as to attract most physicians, there is clear evidence that success in rural recruitment is more likely if efforts are directed toward physicians with certain personal characteristics.

*Peterson, G.L., op. cit.

These include: physicians with avocations such as hunting, fishing, boating, or other pursuits that are facilitated in the area*; older physicians whose children have completed their education and left home;** younger physicians who are unmarried or who have not yet begun their families;** or physicians whose early life was spent in small towns or rural areas.** In a comparative study of physicians in Knoxville, Tennessee and Appalachia,** Champion found that 68 per cent of Knoxville physicians had early home backgrounds classified as urban and 61 per cent of Appalachian physicians spent their childhood in places classed as rural. This has been borne out in many other correlative studies that indicate a strong tendency of many

*Bible, B.L., op. cit.
Champion, D.J., op. cit.

**Champion, D.J., op cit.
Champion, D.J. and Olsen, D.B., op. cit.

physicians to choose a community where they have family ties.* Indeed, as Hassinger** has put it:

"Physicians consciously associate home town and family relations with locating in a given place. It would seem that this is a strong influence in their choice of location."

It is only fair to point out, however, that with every increase in mobility, with improvements in transportation that make outdoor recreational areas as well as relatives in small home towns or rural areas more easily accessible, it becomes more and more difficult to assess the applicability of the results of these studies from the past to the future situation.

b. Professional History and "Attachment Events." These factors include the place where a student receives his undergraduate medical education (leading to the M.D. degree) and the place where he receives his postgraduate (internship and residency) training.

*Peterson, G.L., op. cit.

**Hassinger, E.W.: Background and Community Orientation of Rural Physicians Compared with Metropolitan Physicians in Missouri, Research Bulletin 822, University of Missouri, Columbia, p. 3, August, 1963.

(1) Undergraduate Medical Education.

The report of the Special Committee of the Board of Governors* points out that more than half of all the doctors in the U.S. practice in the state in which they lived prior to undertaking medical training. The report goes on to say that although North Carolina had 2.5 per cent of the national population in 1967, only 1.3 per cent of the entering medical students in the country were North Carolinians and by 1970 this had risen to only 1.7 per cent. On this basis, the Special Committee concluded:

"Clearly, it is incumbent on the state to encourage more North Carolinians to study medicine."

This conclusion, reasonable as it seems on the surface, deserves careful examination in terms of its effect upon future physician manpower in the state. To begin with, the data showing that more than half the physicians in the U.S. practice in the state where they resided prior to undertaking medical training were collected in 1915-1950 although the analysis was not published until 1960.**

*op. cit., pp. 28-29.

**Weiskotten, H. et. al, op. cit.

A more recent, extensive analysis for 1948-1968, issued by the National Bureau of Economic Research* comes to the following conclusion:

"We did not find any evidence that the theory that encouraging more state residents to enter medical school pays off in terms of more physicians returning to practice in their state of origin."

This does not mean, of course, that there would be no "pay-off" in terms of physician manpower for the nation. The changed mobility of physicians and the fact that the perceived "physician shortage" has created not only a national but an international market for physicians has changed the situation during the past decade. This, of course, is one of the principal arguments for Federal support of medical education, an argument, however, that has been of waning effectiveness in recent years. We believe that it is no longer clear that medical education financed by a state will automatically give adequate return on its investment to that state in terms of physician manpower.

*Fuchs, V. and Kramer, M.D., op. cit, p.3.

This discussion neglects completely, of course, another important question, that of a state's desire or obligation to provide additional educational opportunity for its citizens who may be qualified and wish to receive a medical education. This is discussed later in this report in Section VI.

There is no question about the fact that place of residence before studying medicine, place of undergraduate medical education, and place of internship and residency all influence the location of practice. Furthermore, as pointed out in the report of the Special Committee of the Board of Governors, the more recent the experience, the more it influences location. The important study by Scheffler* has demonstrated these relationships quantitatively and conclusively. Table V-G, taken from Scheffler's paper shows the relationship between the state in which the M.D. is awarded and physician manpower.

*Scheffler, R.M., The Relationship between Medical Education and the Statewide Per Capita Distribution of Physicians, Journal of Medical Education, Vol. 46, pp. 995-98, 1971.

TABLE V-G

PHYSICIANS PRACTICING IN STATE WHERE EDUCATED

	No.	<u>1963</u>	%	No.	<u>1967</u>	%
Total Physicians Educated in United States	238,571		100	255,105		100
No. Practicing in State Where Educated	105,455		44.2	109,632		43.0

SOURCE: Selected Characteristics of the Physician Population, 1963 and 1967, American Medical Association, Chicago, p. 12, 1968.

The figures indicate that fewer than half of the country's physicians now practice in the state where they received their M.D. degrees and that the proportion is decreasing over time. Table V-H gives the "retention rates" for specific institutions in the South Atlantic and other states and gives a rough approximation of what return might be expected to a given state by expansion of undergraduate medical education alone. The U.S. average "return" is 42.8%. The UNCCH and the Bowman Gray Schools of Medicine both exceed this with 51.1%* and 43.1%

*UNCCH's retention for its graduates during the 1950's was 67.6%. This may be a more realistic figure since, clearly all of the graduates during that period have now completed training and have settled more or less permanently.

TABLE V-H

MEDICAL SCHOOL GRADUATES BY SCHOOL OF GRADUATION
IN RELATION TO STATE OF PRACTICE, DECEMBER 31, 1967

<u>State Medical School</u>	<u>% of Graduates Practicing in State</u>
D. C. - George Washington University	14.7
Howard University	16.8
Florida - University of Miami	52.4
University of Florida	39.2
Georgia - Medical College of Georgia	58.0
Emory University	41.7
Kentucky- University of Louisville	40.3
University of Kentucky	25.2
Maryland- University of Maryland	36.2
Johns Hopkins University	18.6
Minnesota - University of Minnesota	46.8
Mississippi - University of Mississippi	49.7
North Carolina - University of North Carolina	51.1
Bowman Gray University	43.1
Duke University	26.9
South Carolina - Medical College of South Carolina	60.1
Tennessee - Vanderbilt University	27.7
University of Tennessee	39.6
Meharry Medical College	7.2
Texas - University of Texas	74.4
Baylor University	62.4
University of Texas, S.W.	66.3
Vermont - University of Vermont	18.2
Virginia - University of Virginia	35.6
Medical College of Virginia	41.2
Washington - University of Washington	41.9
West Virginia - West Virginia University	28.5
United States -	42.8

Source: Theodore, C. N. et al. Medical School Alumni, 1967.
Chicago: American Medical Association, 1968.

respectively and Duke's rate is 26.9%. Inspection of the figures for institutions in other states indicates that there is considerable room for improvement of the North Carolina rates, possibly by an effort to enroll more North Carolinians and, most importantly, by considering the influence of postgraduate education upon physician retention in a state, discussed next.

(2) Postgraduate Medical Education. The study of Scheffler* undertook to correlate several aspects of medical education with the number of physicians in a state. The results of his analysis are reproduced in Table V-J and they permit certain very important conclusions:

It can be seen that there is an extremely strong correlation between the per capita number of internships and residencies offered in each state and the per capita number of physicians, number of medical specialists, and number of surgical specialists. Nothing correlates well with the number of general practitioners, probably because they have been decreasing in numbers as specialization

*op. cit.

TABLE V--J
CORRELATION RESULTS

	The Number of Seats in the First Year of Medical School Per Capita	The Number of Short and Long Term Beds Per Capita	Percentages of Intern- ships Accepted in Each State	Percentages of Resi- dencies Accepted in Each State	Per Capita Number of Intern- ships Offered	Per Capita Number of Residen- cies Offered
General practitioners per capita	.31	.43	.14	.16	.28	.30
Medical specialists per capita	.68	.75	.17	.39	.91	.92
Surgical specialists per capita	.66	.70	.10	.42	.93	.89
Total physicians per capita	.69	.76	.10	.37	.90	.89

in medicine increases. On the other hand, there is every reason to believe that an increase in residency spots for primary care physicians (family practice, internal medicine, pediatrics) would correlate well with the numbers of such physicians in a state.

The second highest correlation with numbers of physicians is the number of hospital beds in a state. Since hospital beds are a reflection of hospital facilities and hence, correlate with internship and residency programs, this is not surprising. The link between first year medical seats and physicians is strong (.69) but inspection of Table V-G confirms again that fewer than half of the nation's physicians practice in states where they received their M.D.'s. Finally, as shown in Table V-K there is not a strong link between location of medical schools from which students graduate by state and location of the internships and residencies where they pursue their post-graduate training.

TABLE V-K

PERCENTAGE OF HOUSE STAFF IN TRAINING IN STATE OF GRADUATION						
	0-25%	26-50%	51-75%	76-100%	Total Reporting	
Hospitals with internships						
Number	344	131	64	106		645
Percentage	53	20	10	17		
Hospitals with residencies						
Number	537	187	116	97		937
Percentage	57	21	12	10		

Source: Directory of Approved Internships and Residencies, 1968-1969. (Reprinted from J.A.M.A., 206:Nov. 25, 1968.) Chicago: American Medical Association, 1969, P. 26.

Several conclusions seem justified:

--The per capita number of internships and residencies offered seems to be the most significant variable in explaining the per capita statewide distribution of physicians in the U.S.

--If a state or a region wishes to improve its per capita "share" of physicians, efforts should be made to offer more internship and residency programs. Existing internships and residencies should be made as attractive as possible.

--Quality of internship and residency training must be maintained or else the creation of new programs will not attract students and will merely create unused capacity.

c. The Medical Facilities of the Community.

Virtually all studies of physician location have pointed up the great importance of the availability of facilities and resources that are required to render quality care to patients. These include the accessibility of good hospital facilities, including radiological and laboratory services, availability of specialists and consultants, easy access to continuing education programs, the presence of professional colleagues with whom the workload and responsibility can be shared, and "opportunities for professional growth." These factors are so obvious and well-documented that

we will not belabor them here. It is worth pointing out, however, that the sometimes heard unrealistic suggestion that physicians are being trained in too "sophisticated" ways and that somehow or other there should be a way to dilute the training of primary care physicians so that they can get along without "all those fancy things" misses the mark completely. The range of knowledge and skills required for an individual to do good family practice is formidable indeed. If he practices in professional isolation in a rural area, he assumes great responsibilities which in other settings might be shared with other physicians but he must bear alone. The Report of the Special Committee* of the Board of Governors rightly states:

"Clearly it behooves the state and the local communities to consider ways of getting adequate hospitals, clinics, and other community health facilities strategically located over the state."

Some additional insight into factors which are important can be gained from Table V-L which

*op. cit., page 32.

tabulates the suggestions made by the Virginia physicians who left primary care practice for another specialty.*

TABLE V-L

MEASURES WHICH RESPONDENTS FELT WOULD
BE OF BENEFIT IN ENHANCING A PRIMARY
CARE PRACTICE, VIRGINIA, 1970

	Favored the Number*	Measure Percent
Group practice	68 of 71	96
Residency programs in primary practice	55 of 68	81
Association with house officers and medical students	51 of 69	74
Tax incentives for physicians devoted to primary care	48 of 70	69
Nurse practitioners or physician assistants	45 of 69	66
Prepayment or guaranteed income	32 of 66	49
Direct subsidy to the practice from the community	32 of 70	46

*Some respondents did not answer or gave unusable replies

*Crawford, R.L. and McCormack, R.C., op. cit.

C. The Distribution of Physicians by
Specialty.

The increasing trend of physicians to enter specialty practice (as opposed to general practice, family practice, or "primary care") has been decried nationwide for many years. One result of this has been the firm establishment of the idea that medical care for the citizens of the country would be greatly improved if only the proportion of physicians in "primary care" practice (general practitioners, family practitioners, internists, pediatricians) could be increased. In general we agree that there may be a relative oversupply in certain specialties, but we also believe that much of the discussion of the primary care physician tends to overlook certain important points.

--There is a real need for specialists in medicine and with continuing scientific and technological advances the trend to specialize is likely to continue as a response to these advances and as a result of the intellectual and professional motivations of individual physicians.

--"Primary care" is a specialty in every sense of the word and it is not, as many seem to suppose, something that is mastered as the result of undergraduate medical education. Proper preparation for primary care comes through post-graduate internship and residency training that is (and should be) every bit as rigorous as that which leads to other specialties.

--The main role of the undergraduate curriculum is to give the student a general preparation, basic to all medical practice. If, as it can, the curriculum provides insight, experience, and encouragement to students in family practice and in primary care, it can be expected that more graduates will choose to take postgraduate training in primary care specialties. That such a trend is underway now at UNCCH School of Medicine is documented in the Report of the Special Committee of the Board of Governors* and we have personally satisfied ourselves that there is, indeed, an increasing interest in successive classes at the school in primary care. This is a result, we believe, of "a deliberate attempt at orientation on the part of the medical school and a growing social consciousness on the part of the students."

--It is well to bear in mind that, in recent years, many "primary care" physicians, particularly those in small towns and in rural areas have decided to leave this type of practice (see preceding section) because of lack of facilities, inability to give quality care, professional isolation, etc. It behooves any state to examine carefully what it can do to assure the development and maintenance of those conditions in all regions that will tend to keep these new primary care physicians in primary care rather than have them decide to turn elsewhere.

--Finally, rather than misplaced emphasis upon undergraduate medical education as the vehicle for training primary physicians, states would do better to assure the

*See the Committee Report, pp. 33-34.

establishment of quality postgraduate residency training programs for family practice, internal medicine, and pediatrics since, as has been discussed earlier, the greatest influence upon location of physicians within a state is internship and residency training, not undergraduate medical education.

It would serve no useful purpose in this report to review in detail the many analyses of what the appropriate "mix" of specialists and primary care physicians for a state or region might be. Table V-K, taken from a Minnesota report, gives the range of specialists used in six medical groups that provide prepaid services. As has been emphasized in previous sections of this report, however, these figures tend to be ideal and are difficult to apply to an entire state. The North Carolina Office of State Planning, however, is engaged in an attempt to develop some applicable physician manpower norms for the growth centers of the state and a set of practical guidelines and goals for planning will be available eventually.* Table V-N is an estimate provided by the Planning Office which depicts the state's primary care needs, in terms of patient

*Information from Mr. Elmer M. Johnson, Assistant State Planning Officer, Comprehensive Health Planning Section, Office of State Planning, Raleigh, N.C.

TABLE V-M

PHYSICIANS PER 100,000 POPULATION
SERVED, AVERAGE IN SIX MEDICAL GROUPS PROVIDING
PREPAID SERVICES, BY SPECIALTY

	Average MDs per 100,000 Population Served	
	Mean	Median
Total	109.4	101.2
Internal Medicine	45.2	44.9
Pediatrics	18.0	15.8
(Personal Physicians)*	(63.2)*	(60.7)*
Obstetrics	9.1	8.0
Orthopedics	3.2	3.0
Ophthalmology	3.7	3.3
Otolaryngology	4.6	3.5
Surgery	6.5	6.7
Urology	1.9	1.5
Radiology	4.4	4.0
Physical Medicine	1.3	1.0
Anesthesiology	1.5	1.5
Pathology	1.8	1.6
Psychiatry & Neurology	3.8	2.5
Allergy & Dermatology	4.4	3.9

*Includes internists & pediatricians.

SOURCE: Health Manpower: Perspective 1967.

Bureau of Health Manpower, U.S.P.H.S. (PHS
Publication No. 1667) Washington: Government
Printing Office, 1967. (See pages 9, 10 & 75)

TABLE V-N
ESTIMATED NEED FOR PRIMARY MEDICAL CARE IN NORTH CAROLINA

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Age Group	No. In Age Group	Episodicmedical		Preventivemedical		Obstetrics	
		Multiplier	Visits	Multiplier	Visits	Multiplier	Visits
MALES							
0-4	222,951	4.97	1,108,066	3.2	713,443	--	--
5-14	517,052	2.82	1,458,086	0.3	155,115	--	--
15-24	506,790	2.48	1,256,839	0.2	101,358	--	--
25-34	316,566	1.70	538,162	0.2	63,313	--	--
35-44	283,682	2.66	754,594	0.2	56,736	--	--
45-54	269,836	2.99	806,809	1.0	269,836	--	--
55-64	201,498	3.79	562,179	1.0	201,498	--	--
65 plus	169,992	6.51	1,106,647	1.0	169,992	--	--
FEMALES							
0-4	214,194	5.11	1,094,531	3.2	685,420	0	--
5-14	498,466	3.06	1,525,305	0.3	149,539	0	--
15-24	476,796	2.41	1,149,078	0.2	95,359	1.4	667,514
25-34	327,340	2.52	824,896	1.0	327,340	1.1	360,074
35-44	305,405	3.91	1,194,133	1.0	305,405	0.2	61,081
45-54	292,212	4.04	1,180,536	1.0	292,212	0	--
55-64	235,151	3.94	926,494	1.0	235,151	0	--
65 plus	244,128	7.71	1,882,226	1.0	244,128	0	--
TOTAL	5,082,059		17,368,581		4,065,845		1,088,669

Source: Health and Human Services Section
Office of State Planning
N.C. Department of Administration

visits per year to physicians. It will require much additional work to translate this into local manpower needs.

D. Scholarship and Student Aid Programs Tied to Service Commitment.

A frequently heard suggestion to encourage medical students to opt for practice in a rural area is the provision of scholarship or loan funds to support medical education with a forgiveness of the indebtedness if the student ultimately practices for a certain length of time in a rural area. Programs of this general type have been tried in at least 22 different states. Their effectiveness was reviewed in 1971 by Mason* and, because this idea is raised perennially in state legislatures, we believe that it is worthwhile to present his findings in some detail.

Table V-O, taken from Mason's paper, is a summary description of the sponsorship and provisions of the 17 state plans still in effect and

*Mason, H.R., Effectiveness of Student Aid Programs Tied to a Service Commitment, Journal of Medical Education, Vol. 46, pp. 575-583, 1971.

TABLE V-O

SPONSORSHIP AND PROVISIONS OF FORGIVENESS LOAN PROGRAMS PRESENTLY IN EFFECT

State	When Initiated	Sponsor(s)	Maximum Loan	Conditions for Repayment	Forgiveness Provision
Alabama	1965	State	\$2,000 per yr. 4 years	6 percent interest compounded at graduation; payable after one yr. of practice	For maximum loan: 1. 4 yrs. practice in town less than 5,000 population, or employment in public health or state hosp. 2. 5 yrs. practice in town between 5 and 15,000 pop. 3. 5 yrs. practice in town between 15 and 100,000 pop. for $\frac{1}{2}$ indebtedness. One yr. of practice in town less than 4,000 pop. to forgive $\frac{1}{3}$ of principle; 2 yrs. minimum such pract. For maximum loan: 5 yrs. pract. in town less than 10,000 pop., or state hosp. $\frac{1}{3}$ of indebtedness for each yr. of pract.; but must serve at least 3 yrs. for any credit at all.
Arkansas	1949	State	\$1,625 per yr. 4 years	4 percent interest compounded annually. Payable 1 yr. after completion of internship	
Georgia	1951	State	\$2,500 per yr. 4 years	4 percent interest compounded annually. Payable after 1 yr. of practice	
Illinois	1948	Agricultural association, state medical society	\$1,500 per yr. 5 years	All borrowers must repay at 2 percent interest. Physicians failing to pract. in rural towns must repay at prevailing rates of int.	Physicians agree to pract. for 1 yr. in approved rural community for each yr. they have borrowed. Principal becomes payable beginning 5th yr. after grad. from medical school.
Iowa	1952	State, new medical society program	\$775 per yr. 4 years + \$2,000 per yr. 3 years	7 percent interest compounded at issuance of loan. Medical society loans payable at 5 percent interest*	5 yrs. practice in Iowa for-gives $\frac{1}{2}$ loan and 10% forgiven for each additional yr. of practice.

TABLE V-O (CONT.)

Kentucky	1946	State, medical society (joint)	\$2,500 per yr. 4 years	2 percent int. to maturity and 6 percent thereafter. Loan contracts are for 1 yr. only, and must be renewed annually	One yr. of pract. in area of critical need forgives 1 yr. of loan. One yr. of pract. in area of semi-critical need forgives one-half yr. loan. Also health dept. employment.
Maryland	1966	State	\$2,000 per yr. 4 years	Not yet provided for	One yr. of "family pract." in critical area of need for each yr. of scholarship.
Minnesota	1952	Medical society	\$4,000 total scholarship	8 percent int. compounded at issuance of loan	Pract. in rural area for 5 yrs. for max. scholarship. For lesser amounts, computed on pro-rata basis.
New York	1966	County governments	\$1,000 per yr. 4 years	Not yet provided for	One yr. of pract. in rural county for each yr. of loan.
North Carolina	1945	State	\$2,000 per yr. 4 years	Interest established at time physician is issued first loan	One yr. of pract. in town less than 10,000 pop. for each yr. of loan. May also work as by teaching, employ. in state hosp., or public health.
North Dakota	1955	State	\$2,500 per yr. 2 years	5 percent int. compounded at issuance of loan	One yr. of internship or pract. in town less than 5,000 pop. in North Dakota forgives 20% of prin. and int.
Oklahoma	1970	State, medical society (joint)	\$5,000 per yr. 4 years	10 percent interest compounded at issuance of loan	One yr. of pract. in rural area of need forgives 2 yrs. of loan.
Pennsylvania	1968	Medical society	\$1,000 per yr. 2 years	Not yet provided for	One yr. of internship or pract. in Pennsylvania forgives \$500 of loan.
South Carolina	1952	State	\$1,000 per yr. 4 years	4 percent interest compounded at issuance of scholarship	One yr. of pract. in rural community for each yr. of scholarship.
South Dakota	1968	State	\$2,500 per yr. 2 years	6 percent interest compounded at issuance of loan	One yr. of pract. in South Dakota forgives 20% of loan and int.
Virginia	When Initiated 1942	Sponsor(s) State	Maximum Loan \$1,500 per yr. 4 years	Conditions for Repayment Prevailing rate of interest compounded at issuance of scholarship	Forgiveness Provision One yr. of family pract. in town less than 5,000 pop. for each yr. of scholarship.
West Virginia	1960	Medical society	\$1,000 per yr. 4 years	Prevailing rate of interest compounded at issuance of scholarship	One yr. of pract. in West Virginia for each yr. of scholarship.

* Physicians who have borrowed from medical society are assessed an amount which is 50 percent of their total loan in addition to paying interest if they leave Iowa upon completion of training.

Table V-P is a similar presentation of 5 state plans which have been discontinued. In general, all plans provide or provided for educational loans with forgiveness for some or all of the loan for a specified amount of time as a practitioner in a small town or rural area. It is of interest to note in Table V-P that of the 5 states which have cancelled programs, 4 did so on the basis of the finding, over periods of 15 to 18 years, that a large proportion of borrowing physicians chose to repay the loans rather than to enter rural practice. The Mississippi program, on the other hand, was discontinued on the alleged basis that it had been so successful in getting physicians to settle in rural areas that incentives were no longer needed. If one consults Table V-B, one finds that Mississippi ranked 49th among the 50 states in physician population/ratio in 1967 (three years after this program was discontinued) with figures of 76/100,000 and, in Table V-C which corrects these ratios to include practicing physicians only, Mississippi drops to 50th in rank with a ratio of 70 physicians/100,000 population. Our conclusion is that we neither understand the criteria for discontinuing

TABLE V-P

EXPERIENCE OF FORGIVENESS PROGRAMS NO LONGER IN EXISTENCE

State	Time period	Sponsor(s)	Forgiveness Provision	Reason for Canceling
Florida	1952-1967	State	Loans established as an incentive for young physicians to practice in rural communities.	Practically all borrowing physicians preferred to pay back loan and avoid service in rural areas of need.
Indiana	1947-1966	State	Loans established as an incentive for young physicians to practice in rural communities.	Very high percentage of borrowing physicians preferred to pay back loans or default.
Michigan	1946-1969	Medical society	Like the Illinois program, there was no forgiveness for the loan principal, but for the interest, in exchange for rural practice.	At least one-half of borrowers preferred to pay back loan with interest.
Mississippi	1946-1964	State	Loans established as an incentive for young physicians to practice in rural communities.	In the 18-year period of this program, 625 medical students were awarded loans, and practically all took advantage of the forgiveness provision, many settling permanently in the state's rural areas. Program canceled since incentive was no longer needed.
Nebraska	1947-1964	Medical society	Loans established as an incentive for young physicians to practice in rural communities.	Practically all borrowers preferred to pay back loan and avoid service in rural areas of need.

the program in Mississippi nor the conclusion by the legislature in Mississippi that incentives to rural practice are no longer needed. Of the 17 programs listed in Table V-O, only 11 have been in existence long enough to allow evaluation of their effectiveness in inducing physicians to enter rural practice. These are listed in Table V-Q which includes the North Carolina Medical Care Commission's Incentive Loan Program. It is of considerable interest to note that the aggregate results of these programs show that 60 per cent of borrowing physicians available for practice (i.e. not still in school, residency training, or the armed services) are "paying up" by practicing in rural areas. The North Carolina plan's "success rate" has been 58 per cent. In Mason's study, three of the state lending agencies volunteered information regarding physicians who remained in rural communities after working off their financial obligation. In Georgia, 50 per cent have remained; in Kentucky, 90 per cent have remained; and, in North Carolina, 65 per cent have remained. In North Carolina, the physician manpower

TABLE V-Q

State	EXPERIENCE OF FINANCIAL AID PROGRAMS IN WHICH MEDICAL STUDENTS AGREE TO PRACTICE IN RURAL COMMUNITIES UPON COMPLETION OF TRAINING										
	1	2	3	4		5	6	7	8	9	10
	No. Students Borrowing	No. Still in School, Training or Armed Services	No. Physicians Available for Practice	Physicians Paying up by Rural Practice	Physicians Paying up by Rural Practice	Physicians Paying up by Rural Practice	Physicians Ruying Out of Obligation by Repayment	Physicians Ruying Out of Obligation by Repayment	Physicians in Default of Payment	Borrowers Unavailable for Practice for Other Reasons (Col. 1 is Base Number)	11
				No.	%	No.	No.	%	No.	%	No.
Arkansas	96*	41	55	18	33	31	31	56	6	11	0
Georgia	639	305	289	145	50	144	144	50	0	0	45
Illinois†	146	59	61	45	73	7	7	12	9	15	26
Iowa	62	59	3	2	66	0	0	0	1	34	0
Kentucky	331	91	202	194	98	0	0	0	8	2	38
Minnesota	22	10	12	8	67	3	3	25	1	8	0
No. Carolina	301	145	143	83	58	60	60	42	0	0	13
No. Dakota	40	26	14	10	71	4	4	29	0	0	0
So. Carolina	160	100	60	40	67	20	20	33	0	0	0
Virginia	291	37	244	109	44	135	135	56	0	0	10
West Virginia	22	16	6	4	67	2	2	33	0	0	0
Total	3,110	889	1,089	658	60%	406	406	38%	25	2%	132
											5%

* These are figures for the program beginning in 1958. Data previous to that year are unavailable.

† This program is different from all the others in that all funds borrowed must be paid back with 2 per cent interest. If the contract is not fulfilled, the physician must return the funds with a much higher interest rate.

‡ These reasons include students who died, failed, or left medical school for academic and other causes, as well as physicians enrolled in graduate programs beyond the allowable time period and whose status is in suspension.

§ Column 3 is the base number for percentages in columns 5, 7, and 9.

situation in 83 communities and 57 counties has benefitted from the program*

Most medical educators tend to look with disfavor upon these programs as a form of "indentured service" and Mason** quotes a medical school dean:

"As an individual enters medical school, he usually has insufficient knowledge of the various fields of medicine to really know what type of practice he will eventually want to engage in. Many have observed general practice only in a smaller community, and at the time they enter medical school, this is their primary concept of medical practice. Consequently, they may commit themselves to general practice as freshmen only to find later that some other field of medicine is the one that appeals to them."

The accumulated experience with these plans has shown that roughly half of young physicians have, indeed, chosen to buy out rather than follow through with their commitments to rural practice. On the other hand, a "success rate" of 50 per cent seems an excellent yield. (Compare, for example,

*Message by Governor Jim Holshouser, Delivery of Medical Care to Rural Areas, Joint Session, 1973 General Assembly, April 12, 1973.

**Mason, H.R., op. cit.

the national retention within states of medical students educated in the state of 42.8 per cent, Table V-G). It would seem prudent for North Carolina to retain the incentive loan program of the Medical Care Commission for the present. It is worth pointing out, however, that past success with such economic incentives for physicians does not necessarily predict the future. Physicians' incomes have increased in recent years in both urban and rural practice and young physicians are now paid well enough as interns and residents that they can begin loan repayment before entering practice. We would guess that "forgiveness" programs are likely to become progressively less effective in the future, but another analysis of the "yields" of these plans and, specifically, the North Carolina plan, within the next three years might well establish a trend for the future that will be of practical help in planning to retain or alter the scheme.

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E. Increasing Physician Productivity.

The Report of the National Advisory Commission on Health Manpower* in 1967 was the first major study of physician manpower that regarded the problem as one of providing physician services and analyzed explicitly the historical increase in the productivity of individual physicians through the use of allied health professionals. Since then, this concept of extending the effectiveness of the physician by "surrogates" such as physician's assistants and family nurse practitioners as well as "traditional" nurses, technicians, and health workers has received increasing attention.** Indeed, there are many authorities who believe strongly that no matter how many more physicians are trained, the needs and demands of the public for medical

*U.S. Gov't. Printing Office, Washington, D.C., 1967.

**Fein, R., op. cit.

Carnegie Commission Report, op. cit.

"Glasson" Report, op. cit.

care in this country will ultimately be met only by restructuring the delivery network so as to make maximum use of additional, non-M.D. health professionals.

1. Allied health professionals in North Carolina. As consultants, we find ourselves in the position of bringing coals to Newcastle when we attempt to discuss the extension of physician productivity by allied health professionals for a North Carolina audience. North Carolina institutions and programs have taken a national leadership role in this area of endeavor. The first major program for training physician's assistants originated at Duke and Bowman-Gray is now also at the forefront in providing this type of training. UNCCH has taken the lead in the training of family nurse practitioners. Health educators from across the nation are seeking advice from these North Carolina institutions and efforts to emulate these programs are underway in many states.

Experience in North Carolina to date indicates that physician's assistants and family nurse practitioners improve the productivity of the physicians with whom they work and that they are

extremely useful in extending accessibility of medical care in underserved areas of the state.

Clearly, education of additional new health professionals should continue to receive high priority in the state.

2. Community Clinics in North Carolina. The application of the principle of extending medical care through the use of these new professionals is well underway in North Carolina although much remains to be done before the state will be blanketed with enough clinics. Examples of clinics begun by cooperation between the medical schools and local communities include the Louisburg Clinic, developed with the help of Duke, the Walstonburg Clinic, developed with the help of UNCCH, and the Farmington Rural Community Health Center, developed with the help of Bowman-Gray. The clinics in Madison County, especially the one at Hot Springs, represent largely a community effort and are prototypes of what can be accomplished throughout the state. The proposal by Governor Holshouser in April, 1973, adopted by the legislature, to establish a network of these primary medical care clinics across the state as a cooperative

endeavor between the community and the state, with the supervision and back-up of physicians and hospitals in nearby towns and cities is an important initiative that deserves continuing support.

In our discussions and consultations within the state, we have been struck by the amount of misunderstanding that exists concerning these primary care clinics. Usually, the doubt takes the form of suggesting that the clinics represent a provision for "second-class" care for citizens in rural areas as opposed to "first-class" care for citizens in more urban regions. In actual fact, these clinics provide a mechanism whereby a family nurse practitioner with supervision and back-up support of physicians and hospitals can do a very high proportion of primary care. Just as important, however, is the fact that these clinics provide a rapid method for assuring arrangements so that those patients with emergent or serious injuries or illnesses can be referred and transported to physicians or a hospital for "secondary" care whenever the need arises. The clinics, then, as the periphery of a network, improve accessibility of care and represent an improvement within the

present system, not a substitute for it. Their development should be encouraged and supported in every possible way. We agree strongly with the underlying concept that the establishment of these primary care clinics must be a cooperative endeavor between the community and the state. Local support is an essential ingredient to success and, in the absence of local interest and commitment, the endeavor will fail. A clinic project cannot usefully or effectively be imposed from the outside upon a locality that neither wants it nor feels that it is needed.*

3. Other Measures. Closely related to the overall concept of creating a statewide network for the provision of medical care are affiliations between medical schools and community hospitals in various parts of the state that have sprung up through the years to provide clinical education for undergraduate medical students in different settings, to facilitate internship and residency training, to provide specialty consultation and referral services

*Report on Discussions of the Task Force on the Manpower Distribution Project of the National Health Council, Dept. of HEW Publication No. (NIH) 73-484, Washington, D. C., 1973.

for patients, and to provide opportunities for practicing physicians to receive continuing education, to maintain competence, and to avoid professional isolation. These existing arrangements are now beginning to coalesce into more formal and systematic programs under Area Health Education Centers (AHEC), a concept which offers probably the greatest opportunity to expand quality medical care and education of all types of health professionals in North Carolina. These statewide programs are the subject of Section VII of this report.

VI. THE PRODUCTION OF PHYSICIANS IN NORTH CAROLINA.

If North Carolina is to undertake to accelerate the rate of increase in the number of physicians practicing in the state beyond what is presently projected, there are two general approaches to be explored:

--An increase in the state's production of M.D.'s by expanding the capacity (hence, the eventual output) of the three existing, degree-granting medical schools, by establishing one or more new schools, or by some combination of these methods.

--By various recruitment methods, to attract more of the national pool of physicians to settle and to practice within the state. This would include programs for increasing the "retention rate" for graduates of North Carolina schools, programs calculated to increase the state's "share" of the output of medical schools in other states, and programs to attract more graduates of foreign medical schools to locate in the state.

Clearly, these two approaches are not mutually exclusive and a decision upon an overall, comprehensive program to increase physician manpower in North Carolina should logically be based upon an analysis of the costs, probable effectiveness, and timing of results to be expected from one or the other or combinations of several elements of each.

It is the purpose of this Section of our report to explore alternatives for increasing in-state production of M.D.'s, including estimates of costs and timing of practical results in terms of the return to the state of increased numbers of practicing physicians.

The next Section (VII) is devoted to a discussion of the possibilities included in the second approach, the recruitment of additional physicians from outside the state to settle and practice in North Carolina.

Before giving our assessment of the situation in North Carolina, we wish to make several general points about the education of physicians. Some of these are obvious and well-known while others are often misunderstood and this misunderstanding frequently leads to oversimplifications in discussing medical education.

A. The Education of Physicians.

The education of a physician is lengthy, complex, and expensive. It consists of two formal phases, undergraduate and postgraduate, and a third less well structured phase that is of increasing importance, postgraduate continuing education,

a lifelong process. We will describe each of these briefly.

1. Undergraduate Medical Education. This is carried out in a medical school which the student enters after completing three or four years of college premedical work. It culminates in the awarding of the M.D. degree, generally after four years of study. A few medical schools, by extending the academic year and curtailing vacations, have enabled students to earn the M.D. degree after three calendar years.* The first 1½ years are spent in courses in basic medical sciences, and after a transition period during which the student

*Parenthetically, it should be noted that the "three-year medical school" idea has instant appeal for many laymen. Without discussing the matter in great detail, we will simply state that it is far from clear that it offers any major educational advantage, that its adoption will have any significant impact upon the nation's physician manpower, or that it offers any real economic advantage to student or to medical school. It is certainly not needed to attract qualified applicants into the field of medicine. See: A.A.M.C. Staff Paper, Current Concepts of a Three Year Curriculum, in agenda of Joint Meeting of Council of Deans and Council of Academic Societies, Association of American Medical Colleges, Palmer House Hotel, Chicago, Ill., Feb. 4, 1972.

is introduced to techniques of dealing with patients, the last two years consist of carefully supervised clinical experience during which, as a "clinical clerk" the student examines patients, carries out diagnostic tests, and prescribes treatment. The transition from the classroom and laboratory to actually dealing with patients is often difficult for the student and requires careful supervision and counsel if the educational experience is to accomplish its purpose of developing clinical skills in the student, getting him accustomed to dealing with the sick and with their families, and enabling him to assume more and more responsibility. This crucial phase of medical education is widely misunderstood. It must be carried out under clinical teachers who have the time and skill to teach the student, and to be available when needed for education of the student. Clinical training of medical students cannot be carried out simply by turning students loose in a hospital or clinic full of patients and it cannot be made the major responsibility of busy, usually overworked practitioners of medicine whose first priority is and should be the care of the patients

who come to them for help. Interns and residents, because they are closer to the student, because they are readily available in the teaching setting, and because they are learning themselves, contribute enormously to the education of clinical clerks and their presence is almost a sine qua non for the clinical training of medical students. All of this is not to say that experience with busy practitioners cannot and does not aid the educational process for the student because such individuals contribute greatly to the student's learning on the basis of their skill and experience. Preceptorship experience with a practitioner has proved to be valuable for advanced students in many states. It is, however, quite unrealistic to leave the supervision of medical students completely to even the most dedicated practitioners; someone must take fulltime responsibility for the student's education during this crucial period. At the present time, in North Carolina, the bottleneck to expansion of class size at Duke, at Bowman-Gray, and at Chapel Hill is the need to develop additional clinical settings in hospitals throughout the state where

medical students can be given this clinical education.

Therefore, additional resources and manpower must be devoted to the creation of clinical teaching services if the production of M.D.'s within the state is to increase significantly.

2. Postgraduate Medical Education. This takes the form of an internship followed by a residency in a teaching hospital and consists of caring for patients with gradually increasing responsibility until the young physician becomes capable of independent practice, often eligible for certification as a specialist by one of the medical specialty boards. Most teaching hospitals are part of or are affiliated with university medical centers. After 1975 such an affiliation is likely to be required for accreditation of internship and residency programs. Large numbers of medical students choose internships and residencies outside of the state in which they attend medical school (See Table V-H) and as was discussed in Section V, the location of residency training correlates more closely with the eventual location of practice than does any other phase of medical education.

The average length of postgraduate education is between 4 and 5 years* although some of this time has consisted of required military service since World War II. Unless the doctor draft, now suspended, is reinstituted, postgraduate training is likely to average three years beyond the M.D. degree for most physicians, particularly those who enter primary care practice.

3. Continuing Medical Education.

During a lifetime of practice, a physician must continue his education by reading professional journals, consulting formally or informally with his peers, and attending lectures, courses, professional meetings, and workshops. These programs are the responsibility of medical schools, teaching hospitals, and professional societies. They are necessary for the physician to keep abreast of advances in medicine and their easy availability is often a decisive factor in the decision to locate practice or to change locations. There is no question about the fact that the professional isolation engendered by the inconvenience and difficulty

*Millis, J.S., op. cit.

of "keeping up" in many rural settings is an important disincentive to practice in such areas.

B. Expansion Plans of North Carolina Medical Schools.

1. The Record for 1959-1973. In 1959, the three medical schools in North Carolina admitted 200 first year students, of whom 118 were North Carolina residents. Since that year, gradual expansion at each school has occurred and, by 1972, the total of first year students had increased from 200 to 328 and the number of North Carolina residents admitted had risen from 118 to 183. Table VI-A details these changes on a year-by-year basis and includes information about total applications from North Carolina residents, the numbers admitted to medical school outside the state, etc.

In Section V-A-4, we have used these figures, which represent students already enrolled or graduated, to project the physician manpower situation for North Carolina in 1980. In that projection, it was emphasized that since there is an average of 7 years between entry into medical school and entry into practice, any impact of further increases in medical school enrollment will not be

TABLE VI-A
NORTH CAROLINA MEDICAL SCHOOL APPLICANTS AND
ENTERING MEDICAL STUDENT ENROLLMENT: 1959-1970

Year	Total No. N.C. Applicants ^{1.}	Total No. N.C. Students Entering all U.S. Medical Schools ^{2.}			N.C. Entering Student Enrollment ^{2.}			% of all applicants to U.S. schools accept- ed at any school.
			% of N.C. applicants accepted at some med. sch.	School	No. N.C. Students	No. Out Of State Students	Total	
1959	274	155:	56.5	B.G.	28	27	55	
		82 Pri.		Duke	27	49	76	
		73 Pub.		U.N.C.	63	6	69	
					118	82	200	
1960	230	130:	56.5	B.G.	20	35	55	
		64 Pri.		Duke	23	52	75	
		66 Pub.		U.N.C.	60	9	69	
					103	96	199	
1961	237	140:	59.0	B.G.	26	29	55	
		70 Pri.		Duke	22	55	77	
		70 Pub.		U.N.C.	66	6	72	
					114	90	204	
1962	239	140:	58.5	B.G.	29	24	53	
		65 Pri.		Duke	17	64	81	
		75 Pub.		U.N.C.	69	6	75	
					115	94	209	
1963	233	139:	59.6	B.G.	30	26	56	
		62 Pri.		Duke	16	68	84	
		77 Pub.		U.N.C.	68	4	72	
					114	98	212	
1964	286	155:	54.1	B.G.	32	26	58	
		82 Pri.		Duke	24	58	82	
		73 Pub.		U.N.C.	63	9	72	
					119	93	212	
1965	279	130:	46.5	B.G.	26	31	57	
		67 Pri.		Duke	17	66	83	
		63 Pub.		U.N.C.	59	13	72	
					102	110	212	
1966	289	130:	44.9	B.G.	24	32	56	
		66 Pri.		Duke	15	67	82	
		64 Pub.		U.N.C.	56	15	71	
					95	114	209	
1967	256	123:	48.0	B.G.	26	37	63	
		60 Pri.		Duke	8	79	87	
		63 Pub.		U.N.C.	57	18	75	
					91	134	225	
1968	280	129:	46.0	B.G.	24	38	62	
		66 Pri.		Duke	18	68	86	
		63 Pub.		U.N.C.	59	17	76	
					101	123	224	

TABLE VI-A (CONT.)

-2-

1969	373	175:	46.9	B.G.	37	42	79	
		87 Pri.		Duke	19	67	86	
		88 Pub.		U.N.C.	75	10	85	
					<u>131</u>	<u>119</u>	<u>250</u>	
1970	410	196:	47.8	B.G.	42	35	77	
		98 Pri.		Duke	35	71	106	
		98 Pub.		U.N.C.	86	15	101	
					<u>163</u>	<u>121</u>	<u>284</u>	
1971	460	*	45.6	B.G.	41	35	76	42.3
				Duke	26	78	104	
				U.N.C.	100	10	110	
					<u>167</u>	<u>123</u>	<u>290</u>	
1972	550	*	*	B.G.	40	44	84	
				Duke	26	88	114	
				U.N.C.	97	13	110	
					<u>163</u>	<u>145</u>	<u>308</u>	
				E.C.U.	20	0	20	
					<u>183</u>	<u>145</u>	<u>328</u>	

1. Data for each year obtained from the annual "Study of U.S. Medical School Applicants"; compiled by the Association of American Medical Colleges and published in the Journal of Medical Education.
 2. Entering student enrollment figures were obtained from the annual (November) "Education Number"; Journal of the American Medical Association. Data for 1971 and 1972 was obtained from the individual medical schools.
- * Data not available.

This table compiled by ECU and adapted by The Panel of Medical Consultants.

felt in the state until after 1980. Therefore, we will limit our further discussion of enrollment changes in medical schools to expansions planned beyond the classes entering after the fall of 1973.

2. Plans Beyond 1973. Presently announced plans of the three medical schools (we include the figures of ECU as part of the entering class at UNCCH) are as follows: Duke, with an entering class of 114 in 1972, will go to 126 in 1975; Bowman-Gray, with an entering class of 84 in 1972 will go to 98 in 1975; and UNCCH, with an entering class of 130 in 1972, will go to 160 in 1976. Hence, by 1976, the entering class in the medical schools in the state will have increased from 328 in 1974 to 384 and, by 1980, the total number of medical students enrolled in the medical schools will have gone to 1,536 as compared to 1,124 in 1972. Of the students enrolled in 1980, 928 will be North Carolina residents as opposed to 625 North Carolina residents in 1972. This represents an increase during the next 7 years of 37 per cent for all students and 48 per cent for North Carolina residents. Table VI-B,

taken from the report of the Special Committee of the Board of Governors* details these increases on a year-by-year, school-by-school basis. Table VI-C, taken from the same report, shows that the annual output expected from these increases in enrollment in terms of M.D. degrees awarded will rise from 217 M.D.'s in 1972 to 384 in 1980. The increase in M.D.'s awarded during this period will be 51 per cent for all graduates and 61 per cent for North Carolina residents.

To summarize the present situation, programs in the three existing medical schools of the state for projected expansion beyond 1972 will increase the number of M.D.'s awarded in the state by more than 50 per cent by 1980 and the number of M.D.'s awarded to North Carolina residents by more than 60 per cent.

It is worth emphasizing once more that the greatest constraint upon Duke, Bowman-Gray, and Chapel Hill in planning for further expansion is the limited availability in the state of clinical teaching facilities for the instruction of medical

*op. cit.

TABLE VI-B

CURRENT AND PROJECTED ENROLLMENTS
IN NORTH CAROLINA MEDICAL SCHOOLS
1972-1980

Year	Bowman Gray		Duke		UNC-Chapel Hill		Total		Percentage Increase	
	All Students	North Carolina Students	All Students	North Carolina Students	All Students	North Carolina Students	All Students	North Carolina Students	All Students	North Carolina Students
1972-73	315	157	382	84	427	384	1,124	625		
1973-74	329	172	421	105	471	423	1,221	700	9	12
1974-75	345	178	450	115	500	450	1,295	743	6	6
1975-76	365	187	473	129	532	479	1,370	795	6	7
1976-77	374	194	480	132	560	504	1,414	830	3	4
1977-78	383	201	492	138	590	531	1,465	870	4	5
1978-79	392	208	504	144	620	558	1,516	910	3	5
1979-80	392	208	504	144	640	576	1,536	928	1	2

1972-79 Increase 37%

48%

TABLE VI-C
M.D. GRADUATES FROM NORTH CAROLINA MEDICAL SCHOOLS
ACTUAL AND PROJECTED
1961-1980

Year	Bowman Gray		Duke		UNC-Chapel Hill		Totals	
	All Graduates	North Carolina Graduates	All Graduates	North Carolina Graduates	All Graduates	North Carolina Graduates	All Graduates	North Carolina Graduates
1961 Through 1970 - Total	510	249	816	168	648	600	1,974	1,017
1971	57	23	87	10	76	60	220	93
1972	61	25	86	15	70	54	217	94
1973	75	30	75	9	87	77	237	116
1974	73	39	85	20	100	89	258	148
1975	78	43	103	22	110	100	291	165
1976	89	45	119	33	130	117	338	195
1977	89	45	114	30	130	117	333	192
1978	89	45	114	30	130	117	333	192
1979	98	52	126	36	140	126	364	214
1980	98	52	126	36	160	144	384	232
1971 Through 1980 - Total	807	399	1,035	241	1,133	1,001	2,975	1,641

1972-79 Increase 51%

61%

students and that any significant change in these projections will depend upon the development of additional teaching services within the state.

3. The Effect of an Additional Degree Granting Medical School. Since one of the options for improving the state's physician manpower situation that has received the most discussion and, indeed, led to the convening of this Panel, is the establishment of a new, degree-granting medical school in North Carolina, we have examined the impact that the establishment of such a school might have upon the number of M.D. degrees awarded in the state. For this purpose, we have taken calculations provided to us by the administration of the one-year medical school program at ECU* for the numbers of students that would be admitted on a year-by-year basis if the decision were made to develop a four year, degree-granting medical school on that campus. We have confirmed with the administration at ECU that they still consider that this schedule is a good estimate of what they might

*Contained in Policies of the School of Medicine of East Carolina University, 1973, p. 40.

reasonably expect to accomplish although, quite rightly, they cautioned that unforeseen delays might be incurred at various points along the way. They saw no reasonable prospect that the schedule might be speeded up, nor do we. We have used these figures for this projection without commenting here upon the feasibility of actually undertaking to establish a four year school at ECU or any other location in the state since our purpose now is only to assess the numerical impact of another school upon the physician manpower of the state. Table VI-D gives, in the first two columns, the enrollment estimates provided to us by ECU and, in addition, we have included a column showing new M.D. degrees that would be awarded in each year and the number of physicians that would enter practice in North Carolina in each year. For the latter, we have made the generous assumption that all of those who received M.D.'s from this new school would eventually settle in North Carolina as practicing physicians. This, of course, greatly exceeds the best historical retention rates in any state (see Table V-G). We have extended the projection only until 1985 since this would be the 10th year after

TABLE VI-D

ENROLLMENT AND M.D. DEGREES AWARDED FOR AN ADDITIONAL
FOUR YEAR MEDICAL SCHOOL IN N.C.

Entering Class of Academic Year	No. of Students per class	No. of M.D.'s awarded	No. of Practicing M.D.'s added to N.C.
1974	1st yr. 20 (To UNCCH)		
1975	1st yr. 30 (1st class of 4 yr. program)		
1976	1st yr. 36 2nd yr. 30		
1977	1st yr. 42 2nd yr. 36 3rd yr. 30		
1978	1st yr. 50 2nd yr. 42 3rd yr. 36 4th yr. 30		
1979	1st yr. 60 2nd yr. 50 3rd yr. 42 4th yr. 36	30	

*Assuming entry into practice 7 years after entry in medical school (3 years after receiving M.D. degree) and 100% retention of graduates within the state.

TABLE VI-D (cont.)

Entering Class of Academic Year	No. of Students per class	No. of M.D.'s awarded	No. of Practicing M.D.'s added to N.C.
1980	1st yr. 70 2nd yr. 60 3rd yr. 50 4th yr. 42	36	
1981	1st yr. 70 2nd yr. 70 3rd yr. 60 4th yr. 50	42	
1982	1st yr. 80 2nd yr. 70 3rd yr. 70 4th yr. 60	50	30
1983	1st yr. 90 2nd yr. 80 3rd yr. 70 4th yr. 70	60	36
1984	1st yr. 100 2nd yr. 90 3rd yr. 80 4th yr. 70	70	42
1985		70	50
TOTALS		358	158

entry of the first class to receive M.D. degrees from the school. In other words, the results in Table VI-D are those that might be expected after the first 10 years of operation of a new, degree granting medical school in North Carolina.

According to this projection, the first additional M.D.'s (30) would be awarded in 1979 and these first new physicians would enter practice in the state in 1982. By 1985, the school would have graduated 358 new M.D.'s and 158 practicing physicians would have been added to the state's pool of physician manpower. If one takes these estimates and adds them to the present projection for 1980 of all M.D. graduates, shown in Table VI-C, the cumulative increase over 10 years becomes 55 per cent rather than 51 per cent and, assuming that all graduates of the new school are to be North Carolina residents, the cumulative increase for M.D.'s awarded to North Carolinians rises from 61 per cent to 66 per cent. In the years beyond 1980, of course, the cumulative impact of the output of the new school would increase annually until its full complement of graduates had been reached, 100 new M.D.'s awarded in 1989, 14 years after entry of the first class.

These 100 M.D.'s, using present assumptions, would enter practice in 1992.

This projection demonstrates clearly that the establishment of new, four-year medical school will require many years before it has an appreciable impact upon the numbers of practicing physicians in the state. This is not to say, at this point, that the long-range character of these effects alone should eliminate this alternative from serious consideration. In considering this alternative, however, the timing of expected results should be clearly understood. In the following section, we have attempted to estimate the cost to the state of establishing and operating a new degree-granting medical school.

4. Estimated Costs of Establishing a New Medical School in North Carolina. On the basis of certain assumptions which we will state specifically, we have made a rough estimate of the cost to the state of establishing and operating a new medical school. As pointed out in the report of the Special Committee of the Board of Governors, the likelihood is that Federal funding for construction of medical educational facilities and for

operating educational expenditures will diminish in the future. We will not elaborate on this point other than to state that we are in unanimous agreement with this assessment and to point out that a new school will be largely dependent upon state funding for the foreseeable future. The assumptions that we have made in constructing our model are as follows:

--The schedule outlined in Table IV-D will be followed. This is the one provided by the administration at ECU. We have projected expenditure only until 1982, the first year in which graduates of the new school would be expected to enter medical practice.

--We have estimated operating costs per student to be \$15,000 per year in 1975, the year the first class of a four-year program would be admitted. The calculated state support per student at UNCCH is \$9,650 but this includes not only undergraduate medical students but graduate students, interns, residents, and allied health professional students. The approximate per student cost of the one-year program at ECU in 1972-73 was \$34,000 per year and, ECU estimates indicate that by increasing the class size to 40 rather than 20 and developing a two-year program, this per student cost could be reduced to \$22,000 per year. Our estimate of \$15,000 per year is probably low but we are trying to be as conservative as possible on the cost side in this model.

--We have assumed that per student operating costs will increase at the rate of \$1000 per year. This is based upon inflation and our inability to include any realistic estimates on an annual basis for costs of interns, residents, etc. We believe that economies of scale will occur but our original starting estimate of \$15,000 is low in anticipation of this.

--The estimate of capital costs for a medical science building, teaching hospital facilities, library, and ambulatory care clinic given to us by ECU was approximately \$40 millions for a four-year school. We believe that this is unrealistically low and that \$60 millions is probably a better estimate but we have used \$40 millions in this projection because of our desire to be conservative.

--While we are not prepared to defend these figures in detail, we believe that our estimate is a conservative, ball-park figure. Obviously, what we are proposing is not an operating budget; such a proposal would require much greater detail than we have (or anyone else appears to have at this point) and, of course, updating annually is necessary for realistic budgeting.

--Finally, we are in unanimous agreement that if we were requested to undertake the task of establishing a four-year school at ECU on the basis of this estimate, we would protest that the project was under-financed. It is this perception that convinces us that the projection is a conservative one that does not misrepresent the task as being more expensive than it is likely to be.

Table VI-E shows the results of our projection of costs through 1982, based upon the foregoing assumptions. We have not tried to distribute the capital costs on an annual basis but have simply lumped them in as part of the total expenditure. The calculations show an annual state budget of \$6.16M in 1982 at a time when 280 undergraduate students would be enrolled. This compared with a state budget of \$9.6 millions for UNCCH medical school (exclusive of the operation of N.C. Memorial Hospital) in 1972-73 with 407 undergraduate students enrolled. Since UNCCH at present derives about \$10 millions from federal and other grants and contracts and slightly over \$8 millions from clinical services for a total budget of \$28 millions per year, we believe that these projections that we have made for a new medical school in 1982 are "within the ballpark."

As is shown in Table VI-E, the total expenditure for the new school would be nearly \$66 millions by 1982. If one looks at the actual return to the state by that date in terms of M.D. degrees awarded (158 M.D.'s - Table VI-D) the cost of each of these

TABLE VI-E

ESTIMATE OF COST TO STATE OF A NEW
MEDICAL SCHOOL, 1975-1982

Year	Total No. Students	Cost Per Student	Total Operating Cost
1975	30	\$15,000	\$ 450,000
1976	66	\$16,000	\$1,056,000
1977	108	\$17,000	\$1,834,000
1978	158	\$18,000	\$2,844,000
1979	188	\$19,000	\$3,772,000
1980	222	\$20,000	\$4,440,000
1981	250	\$21,000	\$5,250,000
1982	280	\$22,000	\$6,160,000
			<hr/>
Cumulative Total Operating Cost			\$25,806,000
Estimated Capital Cost			\$40,000,000
			<hr/>
Total Expenditure 1975-82			\$65,806,000

new degrees will have been about \$430,000 each. The 30 new physicians that enter practice in the state that year will have been at the cost of \$2.2 millions each.

The cumulative expenditure for new M.D.'s and new practitioners will fall, of course, in each succeeding year and, to give a balanced picture, we have projected to 1985 (not shown in Table VI-E). In that year, the operating budget of the school from state funds would be \$9.25 millions and the cumulative expenditures would amount to \$90.826 millions. By 1985, then, the state would have produced 358 new M.D.'s at a cost of \$250,000 each and 158 new physicians would have entered practice at a cost of about \$575,000 each to the state.

We do not believe that a projection such as this can be subjected to any meaningful cost-benefit analysis. We have probably underestimated on the cost side and have surely overestimated on the benefit side by assuming that 100 per cent of the graduates of a new school would become practicing physicians and would remain in the state. That there would be opportunity costs in terms of other

state programs if a decision were made to spend \$90 millions (more or less) of state funds for a new medical school is clear, but we know of no calculus that will predict what those foregone opportunities might be.

5. Other Possibilities for Expanding the Output of M.D.'s in North Carolina. During the decade 1962-1972, the three degree-granting medical schools in North Carolina expanded the size of their entering classes as shown in Table VI-F. The cumulative results during the decade show an increase of from 115 to 183 (59 per cent) in enrollment of North Carolina residents and an increase from 209 to 328 in total first year enrollment (57 per cent) for an expansion of first year entering places by 119. This is the equivalent of the output of a new medical school. This expansion was attributable to a number of factors: recognition of the need to produce more M.D.'s, increases in enrollment required to qualify for federal capitation subsidies, and, since 1969, the allocation of state funds to the two private schools in return for their increasing their enrollment of students from North Carolina.

TABLE VI-F

EXPANSION OF ENTERING CLASS SIZE
IN N.C. MEDICAL SCHOOLS
1962-72

Year	School	No. of N.C. Students	No. Out- of-State Students	Total
1962	Bowman-Gray	29	24	53
	Duke	17	64	81
	UNC	<u>69</u>	<u>6</u>	<u>75</u>
	TOTAL	115	94	209
1972	Bowman-Gray	40	44	84 (58%)
	Duke	26	88	114 (41%)
	UNC (inc. 20 enrolled at ECU for transfer to UNCCH)	<u>117</u>	<u>13</u>	<u>130</u> (57%)
	TOTAL	183 (59%)	145 (54%)	328 (57%)

(Numbers in parentheses indicate percentage increase since 1962)

What are the possibilities for similar enrollment increases (above and beyond those already projected - see Tables VI-B and VI-C) for the next decade and what would be the cost to the state for additional first year places? In this section, we will examine the constraints on planning for further expansion at each of the existing medical schools in North Carolina and review the estimates of the schools themselves, provided to us on request, of what might be possible if these constraints can be removed. Generally, it can be said that the main obstacles to further expansion of the existing schools are insufficient operating funds and the lack of additional facilities in which to give clinical training to enlarged classes of medical students. A secondary difficulty has been uncertainty about the number of qualified North Carolina applicants and this will also be discussed.

a. The Private Schools of Medicine.

There are two major constraints to any further expansion of first year classes at Bowman-Gray School of Medicine or Duke University School of Medicine. The first is the lack of availability of adequate clinical facilities for the instruction of additional

medical students. The second is a lack of operating funds. While neither school is in a position to commit itself to increasing the total first year enrollment, both have responded to the state funding by expanding the number of North Carolina students enrolled and both have indicated a willingness to further increase the proportion of North Carolinians enrolled under the following conditions:

--That the allocation of state funds to support North Carolina students enrolled in private medical schools within the state be made on the basis of "parity" with the UNCCH medical school. This concept of parity means that Duke and Bowman-Gray would receive from the state an annual sum for each North Carolina student equal to that received by UNCCH. This now amounts to approximately \$9650 per year.

--In return, the private schools would charge North Carolinians the same tuition that they would be required to pay at UNCCH. This would have two advantages. First North Carolina students would be able to select the school within the state that they wished to attend without concern about the tuition differential (\$950 at UNCCH, \$2,450 at Bowman-Gray and \$2,540 at Duke). Second, all three schools would have an equal competitive chance, economic considerations aside, to attract into their classes the best-qualified of the pool of North Carolina applicants. A third advantage hoped for by the schools would be the possibility of keeping in North Carolina a good number of excellent applicants who now choose each year to attend "prestige schools" outside the state.

--Eventually, if further expansion in total numbers of students becomes possible through the availability of new and adequate clinical teaching services, the private schools would expect the state to share the cost of affiliation agreements with various hospitals within the state. This is discussed at length in the Section VII of the report.

At a time when federal support for medical education is shrinking, funding from private sources is limited, and costs are rising, it seems entirely reasonable to expect the state to defray the costs of placing additional North Carolina students in the private medical schools.

It is worthy of re-emphasis at this point that both Duke and Bowman-Gray agree that the rate at which additional expansion of total enrollment of medical students beyond that already projected by 1980 can occur in the private medical schools, in the medical school at UNCCH, or in some new degree-granting institution is now limited by and will be paced in the future by the rate at which additional arrangements to provide clinical experience for medical students can be developed in the state.

b. UNCCH School of Medicine. Present plans, already underway, call for an increase of entering class size from the present 130 (including

20 transfer students from ECU each year) to 160, beginning in 1976 (VI-B-2 and Table VI-B). Funds to provide additional basic science facilities and to expand clinical teaching facilities at N.C. Memorial Hospital have already been authorized and the main concern of the UNCCH administration about their ability to hold to the projected schedule has to do with the development of the additional clinical teaching facilities in various hospitals around the state to provide for instruction of these additional students by 1977-78 when their first clinical studies will commence. If these arrangements could be speeded up, it is probable that UNCCH would be able to accelerate the rate of its expansion of first year students at Chapel Hill.

c. Other Considerations for the Future.

Since it is abundantly clear that expansion of the production of M.D.'s in North Carolina, beyond what is presently projected will be crucially dependent upon additional arrangements for clinical instruction of medical students within the state, the two additional possibilities that should be borne in mind for the future will be mentioned only briefly.

They will become germane only when the bottleneck of clinical instruction has been solved.

1. ECU Medical Program. If the existing problems of quality and accreditation (see next Section) that have plagued the ECU Medical School can be solved, it might eventually expand its enrollment of entering students for a one or two year program to a size that would take advantages of economies of scale and these students could then be transferred to one of the established schools for the clinical portion of their undergraduate education and the awarding of the M.D. degree. The overall situation at ECU is discussed in detail in the next section of this report.

2. North Carolina State University (NCSU). A second possibility for the future would be the establishment of a one or two year program of medical education at NCSU in Raleigh. A Task Force appointed by President William Friday explored this possibility in early 1971 and found such a program to be both feasible from an academic viewpoint and reasonable in cost. Apparently, the proposal to create such a program was never formalized and has lain dormant. It was reviewed in November, 1972

and adjustments were made in cost estimates and, on the basis of our review of the plan, we believe that it should be retained as a viable alternative for the future. The essence of the plan and cost-estimates for it will be given here. NCSU has offered premedical and preveterinary science programs for many years and has a nationally-recognized graduate education program in basic biological sciences which uses a wide range of professional expertise immediately applicable to basic medical education. The Task Force came to four conclusions and, after reviewing the situation, we agree with them:

--Instruction in the biological sciences equivalent to the first year of medicine is feasible at NCSU.

--Major curriculum gaps in NCSU course offerings are in human pathology, "clinical experience," and gross anatomy. Action should be taken at NCSU in Raleigh to provide instruction in pathology and "clinical experience," but human anatomy should probably be taught at UNCCH through special arrangements. (Since UNCCH is now using Wahe County Hospital in Raleigh for clinical teaching, this seems to us to be an even easier arrangement than when first suggested in 1971).

--A basic medical program, if established at NCSU should be developed in 3 stages:
(i) A program development year with no

students; (ii) a first year with 10 students; and (iii) a second (and subsequent years) with 20 students.

--A unified admissions program should be established whereby students would first be admitted to the UNCCH Medical School with subsequent assignment to the NCSU program.

The budgetary requirements for implementation of such a program at NCSU, updated in November, 1972 can be summarized as follows:

	<u>Non-recurring</u>	<u>Recurring</u>	<u>Totals</u>
Program Development Yr.	\$98,000	\$101,000	\$199,000
First Program Yr. (10 students)	52,500	152,700	205,200
Second Program Yr. (20 students)	0	161,900	161,900

(Average cost per student for second program year and subsequent years - \$8,095)

It should be pointed out emphatically that NCSU did not seek when the original Task Force was appointed and is not now seeking a one-year medical school.

Rather, the rationale of considering the provision at some time in the future of NCSU of basic biological instruction equivalent to that received by first year medical students recognizes the existence of facilities, highly competent faculty,

existing course structures, and nearby teaching clinical facilities that could be used at low cost and to great advantage in future expansion of undergraduate medical education in North Carolina.

d. The Applicant "Pool" in North Carolina.

The Report of the Special Committee of the Board of Governors* expresses, in no uncertain terms, the opinion that North Carolina should encourage more state residents to attend medical school. While in V-B-1-b-(1), we have given reasons to believe that this may be of decreasing significance as a method for enhancing the number of physicians practicing in a state, we have become well aware of another source of legitimate concern and this is the question of the extent to which, on the basis of educational opportunity alone, a state wishes to provide its qualified residents with the opportunity to receive a medical education. As is well known, there has been an enormous increase nationally in the numbers of applicants to medical school in recent years and their quality (as judged by motivation, scores on

*op. cit., p. 29.

Medical College Aptitude Tests, collegiate records, and personal interviews) has also been increasing. Past and present efforts to gain admission for more North Carolina applicants into North Carolina medical schools, particularly the two private schools, have raised questions about whether further increases in admissions for North Carolina students might not entail the selection of North Carolina applicants of lesser quality than applicants from the rest of the U.S. We understand and sympathize with this concern but, after considering the situation, we do not see it as a significant problem. We base this judgement (which is agreed to by the administrators of the 3 medical schools) upon the following: As is shown in Table VI-A, the number of North Carolina applicants has been increasing, rising from a plateau of 250 to 280 per year during most of the 1960's to 373 in 1969, 410 in 1970, 460 in 1971, and 550 in 1972. During this period, the percentage of state applicants accepted in medical school somewhere in the U.S. has fallen from 55-60 per cent in the early 1960's to 45.6 per cent in 1971 (the last year for which data are available). There is

no reason to believe that the national trend of increased quality as well as quantity does not hold for North Carolina applicants and, if state allocations to private medical schools can equalize competition for the best qualified applicants (See VI-B-5-a), we do not view a shortage of qualified applicants as a significant barrier to further enrollment of North Carolina applicants. In actual fact, the entry, in 1971, of 45.6 per cent of North Carolina applicants into medical school exceeded the national average of 42.3 per cent and, as is seen in Table VI-G, taken from the most recent data of the Association of American Medical Colleges,* is much better than that of many states.

Finally, we believe that an announcement of a long-range program to increase admissions of North Carolina residents into the state's medical schools with an appropriate subsidy for tuition in the private schools will stimulate additional, high quality applicants.

*Dubé, W.F., Johnson, D.G., and Nelson, B.C., Study of U.S. Medical School Applicants, 1971-72, Journal of Medical Education, Vol. 48, pp. 395-420, (May), 1973.

e. Admission of Minority Students to Medical School in North Carolina. It was not a part of our charge to examine in any detail the complex question of providing additional opportunity to students who are members of minority groups to enter medical school. It is unrealistic, however, to make recommendations for a statewide plan of medical education without addressing this important issue. Furthermore, we had the opportunity to meet with representatives of The Old North State Medical Society to hear their views of the problem. These may be summarized as follows:

--Although progress has been made in the sense that black enrollment has increased in all three of the medical schools in North Carolina, it has not been as rapid as they would have liked and they believe that most of the improvement has come from pressure rather than a true institutional commitment to correct longstanding inequalities in opportunities for blacks to enter the medical profession.

--The fear was expressed that the advances already made will be lost unless pressure is maintained, as evidenced by a major drop in the number of black students to enter North Carolina's medical schools in the fall of 1973 (this turned out to be based upon erroneous information about the size of black enrollment at UNCCH for 1973; furthermore, according to the National Fund for Medical Education, there has been a nationwide plateauing of

black admissions to medical schools for 1973 so that what was being observed was not specific or peculiar to North Carolina).

--The opinion was expressed that blacks would have a better chance of gaining admission to a new, degree-granting medical school than to the three existing medical schools. The Society, therefore, recorded its opposition to any further expansion of existing institutions and its support for the establishment of a new, degree-granting medical school.

--It was suggested strongly that an arrangement be made with the Howard University School of Medicine similar to the longstanding contract through the SREB with Meharry to reserve places for acceptable black applicants from North Carolina.

--Additionally, it was suggested that, because black students are often the most financially destitute, that both Meharry and Howard be paid the same amounts per student as are allotted to Duke and to Bowman-Gray for the enrollment of North Carolina students.

--Finally, it was pointed out that despite the admitted advances in enrollment of blacks into medical schools in North Carolina, much less progress has been made in obtaining internship and residency appointments for blacks in the state.

In addition, it became clear in the discussions that the Old North State Medical Society would readily cooperate in any additional efforts to interest qualified black college students in careers in medicine.

While we do not agree with the view that a new medical school will necessarily admit proportionately more black students than will the already existing schools, we recognize that provision of opportunities for more blacks to enter medical school is a continuing problem in North Carolina as well as the rest of the nation and that serious consideration must be given to improving premedical education for blacks, to recruiting qualified black students into medicine, and to providing better programs of financial aid for those black students who need it. We have included these matters in our recommendations.

C. The Present Medical Program and the Proposal to Establish a New Medical School at ECU.

In the Report of the Special Committee of the Board of Governors which recommended the appointment of this Panel, one of the specific charges suggested was that the Panel examine "the present medical education program at East Carolina University."* This program, initiated with the admission of 20 students in September, 1972, consists of a one-year

*op cit., p. 61.

medical curriculum from which students (if performance is satisfactory, of course) are automatically transferred to the School of Medicine at UNCCH to complete the last three years of undergraduate medical education. The plan calls for the award of the M.D. degree by UNCCH.

Before this Panel was selected, however, the program at ECU was examined and evaluated by another group, a Survey Team of the Liaison Committee on Medical Education, which represents the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. The task of the Survey Team was to evaluate and accredit the entire program of medical education at UNCCH. Its evaluation of the program in Greenville was based upon written responses by ECU to a series of questions and a visit by the team to ECU on January 30, 1973.

The findings and recommendations of the Survey Team, after review and approval by the Liaison Committee on Medical Education, were transmitted to President William Friday, the UNCCH administration

and the ECU administration on April 9, 1973.* The report was subsequently distributed to the Board of Governors and made available to us. While such reports are held confidential by the Liaison Committee and its parent organizations, this one was thoroughly publicized in North Carolina and we have not hesitated, therefore, to quote it here. It might be noted, in passing, that every member of the Panel has had extensive, first-hand experience with these accreditation evaluations as examiners and/or "examinees" and we are thoroughly familiar with the criteria and procedures employed.

During the past few months, we have conducted our own, independent investigation of the ECU program. We have conferred at some length with those directly responsible for the program on three different occasions, we have examined written materials supplied by them spontaneously and at our request, and we spent a day in Greenville, seeing the facilities and being briefed on the existing programs and future plans at ECU.

*Report of the Survey, University of North Carolina, Chapel Hill School of Medicine, Chapel Hill, N.C. by the Liaison Committee on Medical Education, Jan. 29-31, 1973.

It is the purpose of this section of our report to indicate our evaluation of the one-year program as it now exists and to give our opinion of the proposal to expand the program with the eventual creation of a new, four year school of medicine.

At the risk of being repetitious, we will treat this matter in some detail because the ECU program and proposal have featured prominently in recent discussions of the physician shortage in North Carolina and we feel a heavy obligation to lay out the issues for the Board of Governors as clearly and as unequivocally as we possibly can.

1. History of the ECU Program in Medical Education. The history of the ECU program can be outlined as follows:

--1965: The General Assembly authorized East Carolina College to establish a two year school of medicine and appropriated funds (\$250,000) for planning.

--1965-66: Consultants recommended the integration and expansion of allied health professional education by establishing a division (or institute) of life sciences and community health.

--1967: The General Assembly renamed East Carolina College as East Carolina University and renewed authorization to establish a two year school of medicine.

--1968: School of Allied Health and Social Professions was established and Edwin W. Monroe, M.D. was appointed Dean of the new school and Director of Health Affairs at ECU.

--1969: The General Assembly again appropriated funds for the development of a two year school of medicine at ECU during the following biennium.

--1970: Wallace R. Wooles, Ph.D. was appointed Director of the Division of Medical Sciences at ECU.

--1971: The Liaison Committee on Medical Education denied the school at ECU provisional accreditation in its own right. The General Assembly approved a recommendation by the Board of Higher Education to begin the ECU School of Medicine as a first year program of medical education in cooperation with UNCCH which agreed to accept ECU students as transfers to its second-year class automatically. Because UNCCH was fully accredited, such an arrangement made it possible to extend this accreditation to include the new program at ECU as a part of the overall program of medical education at UNCCH.

--1972: The first class of 20 students was admitted to the ECU program. They were chosen from among 214 applicants.

--1973: All 20 students completed the ECU one year program satisfactorily and will enter UNCCH as second year medical students in September. The second class of 20 students, chosen from among 418 applicants, will enter the ECU program in September. The General Assembly appropriated \$7.5 millions into a reserve fund to create an additional degree-granting school of medicine within the UNC system (site undesignated).

--The reorganization of the University of North Carolina in 1972 resulted in a change in titles. Dr. Edwin Monroe is now Vice-Chancellor for Health Affairs and Dr. Wallace Wooles is now Dean of the School of Medicine.

To clarify the present situation, it is necessary to supplement this outline in several respects.

a. Accreditation of the ECU Program.

The action of the Liaison Committee in 1971 in extending the accreditation of the UNCCH school of medicine to include the ECU program was taken with the explicit understanding and official recognition of the fact that UNCCH would assume responsibility for the standards and quality of the affiliated program at ECU. The ECU program was not and is not separately accredited; it is, for accreditation purposes, an integral part of the program of medical education of UNCCH and any shortcomings in the program at ECU are a direct threat to the accreditation status of the entire School of Medicine at UNCCH.

b. Working Relationship between ECU and UNCCH. We were informed by a member of the legislature that: "The entire history of the ECU medical school has been attended by criticism,

second thoughts as to its advisability, academic in-fighting, and political power plays."*

Certainly, from all that we have been able to ascertain, the compromise approved by the General Assembly in 1971 forced ECU and UNCCH into a collaborative relationship that was welcomed by neither institution. From what we have learned, we can only conclude that ECU interpreted the arrangement to be one in which its supposed dependency upon UNCCH connoted loss of academic autonomy, unwarranted interference in an ongoing planning process, administrative subservience, and further delay in implementing its publicly avowed desire to develop an independent degree-granting school of medicine. All of this was bitterly resented and, as the record shows, most overtures from UNCCH were greeted defiantly. UNCCH, on the other hand, apparently regarded the arrangement as an unsought and unwanted burden thrust upon it by political compromise, which placed it in the awkward position of being responsible for a pedestrian program which

*Senator Hamilton C. Horton, Jr., Statement before the Panel of Medical Consultants to the Board of Governors of the University of North Carolina, July 13, 1973.

it had had no hand in planning and about which it had been not only unenthusiastic but highly critical.

It is our perception that negotiations between the two institutions were entered into reluctantly, have tended to be competitive rather than cooperative, and have taken place, as the Survey Team* put it, in a "highly charged emotional and political atmosphere." Nonetheless, a tentative agreement was reached in April, 1971 on such issues as admissions standards, qualifications of faculty, content of teaching program, facilities required, and appraisal of student progress.**

By October, 1972, the Deans of the two schools were able to report substantial progress in terms of formal guidelines and joint committee arrangements for the affiliation between the two institutions.***

*Survey Report, op. cit, p. 10.

**Report of the Joint Study Committee on Cooperation in Medical Education between the University of North Carolina and East Carolina University, April 15, 1973 (p. 75 in Policies of the School of Medicine of East Carolina University, 1973).

***Fordham, C. and Wooles, W.R., Report to President Friday Concerning the Status of the Cooperative Arrangement between the School of Medicine of the University of North Carolina and the School of Medicine of East Carolina University Relating to the Areas of Admissions, Curriculum, Promotions, and Faculty, Oct. 12, 1972.

It is clear to us, however, that the available documentation of procedures to be followed does not portray the looseness that characterized the actual working relationship between UNCCH and ECU up until the time of the Survey Committee Report* in April, 1973. This report, of course, was critical of the ECU program and caused President William Friday to mandate that UNCCH take a stronger hand in the direction of the ECU program. The results of this new thrust are not yet apparent since most of the experience to date has been during a period of vacation rather than an academic session.

At any rate, we believe that we have been provided with a reasonably accurate summary of the situation that has resulted from the acceptance by the General Assembly of the Board of Higher Education's recommendation in 1971:

"Although mandated by the Administration of the University and stipulated by the provisional accreditation in 1971, it is evident that the Chapel Hill and ECU schools have not worked together as closely as needed. The reasons, whether

*op cit.

of resentment, pridefulness, arrogance, professional sensitivity or whatever are irrelevant: both faculties, both schools, have been as sinned against as sinning."*

2. The Present One Year Program at ECU.

Since we are in unanimous agreement with the Survey Team Report** we will simply quote its findings and make some additional observations.

a. The Survey Report. The following is taken verbatim from the report:**

The East Carolina University School of Medicine

Frankly, of much greater concern is the one year program of medical education at the ECU School of Medicine.

- (1 It is not the responsibility of the survey team to decide whether North Carolina should have a fourth medical school, nor where it should be located; however,
 - a) The team urges that that decision be made as rapidly as is consistent with a considered judgement based on the facts surrounding the issue of the need for more physicians in North Carolina, the influences bearing on their distribution,

*Senator Hamilton C. Horton, Jr., op. cit.

**op. cit. pp. 29-31.

and the effects of the costs of additional manpower development efforts on the existing schools in the state as well as new schools.

- 2) The reality of the present situation is that the survey team finds the ECU program seriously lacking in acceptable quality in its present form. The material given the team was scanty and there was little evidence of progress over the past two years with the exception of the recruitment of an able class of students.
- 3) The basic question arises as to whether the current circumstances and relationships between the UNC Medical School and ECU School of Medicine reflect:
 - ..a lack of assumption and exercise of authority and responsibility on the part of the UNC Medical School, or
 - ..a refusal of the ECU School of Medicine to recognize the role of the approved institution (UNC - Chapel Hill, Medical School) under whose accreditation they are permitted to accept students and to operate as an "accredited" one year educational program, or
 - ..have the legislators and Board of Governors failed to delineate the responsibility and authority appropriate to the circumstances?
- 4) Problems to be solved if ECU is to develop an adequate program even at the one-year level--
 - a) More depth in the basic sciences faculty, with more experience in teaching in medical school.

- b) There are still major departments without heads.
 - c) The system of appointment and promotion of the faculty was variously described and there is no formal input and assistance from UNC-Chapel Hill.
 - d) There is little evidence of planning strength at the managerial level at ECU.
 - e) UNC Medical School, if it is to bear the responsibility for the ECU program must have adequate quality control over the following:
 - admission and promotion of students
 - assurance of integration of the curriculum
 - selection of the faculty
 - planning, including budgetary and space plans
- b. In fact, the ECU one-year program represents a generic national problem in that this type of arrangement portends the "open university" if parent organizations or medical schools can develop an unlimited number of satellites without real quality control and supervision.
- c. It is the conclusion of the survey team that the East Carolina University program is not viable in its present form. The University of North Carolina School of Medicine must either have clear responsibility for and realistic control for quality assurance purposes of the medical education program at ECU or divest itself of the program, as any further deterioration of the ECU effort could

jeopardize the accreditation of the University of North Carolina at Chapel Hill School of Medicine.

b. Students and student selection. We have not had the opportunity to assess the quality of the students selected for the program at ECU directly. We have been told repeatedly by the administration and faculty at ECU that the "students are the best thing about the program." The Survey Team found them to be "highly motivated," "intelligent," and "attractive." One of the few faculty members at ECU who has had experience in teaching medical students elsewhere remarked to the Survey Team that he felt that it was necessary to teach the ECU students a little more slowly than had been the experience in other medical schools but he did not believe they were "out of the main stream of medical students" but rather clustered in the middle group in performance.

The students are selected independently of the admissions procedures at UNCCH by a committee whose chairman lacks previous experience in this area. It is his stated belief that he has a rather low regard for scores on Medical College Aptitude Tests (MCAT) except for the one on verbal ability. The

median MCAT scores for the 1972 entering classes at ECU and UNCCH were:

	Verbal	Quantitative	General Information	Science
ECU	500	575	500	525
UNCCH	555	587	562	556

While we have no doubt about the ability of ECU to attract able, well-qualified students into its program for the immediate future we seriously question the wisdom of maintaining separate admission policies and procedures for two parts of what is really a single program of medical education. We can see no advantage to the existing procedure and we would note the following disadvantages: There is unnecessary duplication of effort in screening applicants and in interviewing; the admissions committee at ECU has not drawn upon the much greater experience of UNCCH in selecting students; the present procedure is another divisive effort that seriously impairs appropriate integration of these affiliate programs; and, ECU has not made use of the much greater pool of applicants at UNCCH for the selection of its students.

c. Curriculum. Apparently because of ECU's desire to maintain its independent stance, it has undertaken, despite the notable lack of experience of its faculty in designing medical education programs, to design a "highly traditional" curriculum that is based upon an approach quite different from that used at UNCCH. This has resulted in an almost deliberate "mismatch" for the students who will be transferring to UNCCH to complete their training. This is a result of drift rather than design. Even limited exchange with UNCCH would make it possible to exchange views on different approaches and to put to test certain hypotheses about the curriculum. As it is, ECU has gone its separate way, without regard for the fact that its students will end up at UNCCH and UNCCH has either been willing to countenance this or unable to intervene effectively.

One aspect of the ECU curriculum that is felt to be an improvement is early clinical experience with physicians in the community. The objectives of this, the evaluation of its beneficial effects, the way in which supervisory physicians are selected

and instructed as to the educational aims, are quite unclear from either discussions or written descriptions. The students, as might be expected, are enthusiastic at such experiences as suturing lacerations in an emergency clinic but such "clinical exposure" at this stage, is of doubtful educational benefit.

We are unanimous in feeling that if the ECU program is to continue, UNCCH must have both the responsibility and the authority to control the curriculum so as to assure that ECU students are "in step" with UNCCH when they transfer rather than to permit the present discontinuity.

d. Faculty. Recruitment of faculty for the ECU program has been difficult for many reasons: uncertainty about academic opportunity because of uncertainty about the future of the program; lack of experience by the administration in evaluating and recruiting medical school teachers; and, undoubtedly, disadvantages which Greenville shares with other less urban areas in recruiting medical personnel. Indeed, the Survey Team went so far as to suggest incentive pay* for teaching

*Ibid, p. 22.

in Greenville. Despite these difficulties, ECU has not sought help from UNCCH, UNCCH has not forced the issue, and ECU has actually rejected the idea of joint appointments for faculty at ECU and UNCCH. The end-result was described in the Survey Report* in what we judge to be an accurate statement:

"The faculty which has been recruited to date, with some exceptions, can be generally described as one of modest accomplishment. There is no reason to believe that they are not competent but they are not recognized as outstanding. Again, with notable exceptions, there is a general lack of experience in teaching medical students or of having had a major role in the planning and development of medical education programs."

The present situation is one in which faculty quality will deteriorate further unless UNCCH intervenes vigorously.

e. Administration and Planning. We believe strongly that in addition to the lack of real collaboration between UNCCH and ECU, the major factor that has led to the present low level of the ECU program is the lack of experienced academic leadership. This administrative naïveté, the

*op. cit., p. 22.

tendency to "go it alone" in deliberate isolation from the reservoir of superior expertise and experience at UNCCH, and the tensions associated with the many uncertainties that have characterized the ECU program have combined to create a situation in which the only hope for improvement that we can see will be the assignment of full authority and responsibility for upgrading and maintaining the program must be made to UNCCH. If the ECU program is to be viable, the pretense that it is anything other than part of the UNCCH program must be cast aside and UNCCH must take firm and decisive control.

3. The Proposal to Develop a Four Year Medical School at ECU. In Section VI we have calculated the long-term impact of another state medical school in North Carolina. In Section VI we have calculated the costs of building and operating such a school. In neither of those discussions did we discuss the feasibility of establishing a new school of medicine.

It must also be emphasized that we have not been presented with anything that remotely resembles a plan for a new four year school at ECU or

elsewhere. We have been given a tentative enrollment schedule by ECU which was utilized in our manpower and cost models earlier in this Section. Indeed, our other efforts to obtain more specific information or even ideas have been turned aside with the assertion that one cannot realistically plan a project without having received the authority to implement it. This, of course, can lead to circular discussion since one could also argue that implementation should not be authorized in the absence of a specific plan.

However this may be, we will attempt to give our views about the feasibility of a four year medical school at ECU. It has already been pointed out that the greatest obstacle to the production of additional M.D.'s by the already existing three medical schools is the lack of facilities in the state for clinical instruction of additional medical students. It has also been emphasized that while there are numerous additional hospitals and beds scattered throughout the state that might eventually be used for the instruction of medical students, these await development as teaching facilities. Finally, it has been emphasized that

the first step in the development of clinical teaching is the establishment of internship and residency programs followed later by the addition of medical students as clinical clerks.

At present, there exist essentially no internships or residencies in the hospitals in the Greenville area or, indeed, in most of Eastern N.C. The establishment and accreditation of such programs requires full-time directors of medical education, a great deal of time and, until accreditation is received, it is unrealistic to think that newly graduated M.D.'s will appear on the scene. Until such programs are established, it is merely wishful thinking to believe that another medical school can be established and accredited, no matter what monetary resources are available for undergraduate medical education.

In our discussions with the authorities at ECU, we have discovered nothing resembling an initial plan to establish residency programs and, eventually, clinical teaching programs for medical students in the Pitt County or other nearby hospitals.

We believe that this lack is attributable to:
a lack of experience on the part of the administration

at ECU in managing, much less establishing, such programs and, hence, a gross under-estimation of the time and effort that will be involved in providing adequate clinical teaching for medical students. This problem is discussed in detail in Section VII and suffice it to say here, since all of the benefits to medical care in an area including recruitment of physicians into practice are more likely to come from local residency training programs than from the presence of clinical clerks, we believe that the advocates of a four year medical school at ECU have been greatly oversold on the idea that these local benefits will arise from undergraduate as opposed to postgraduate medical education.

In summary:

1. We do not see how a commitment to build a four year medical school can possibly be fulfilled at ECU or, indeed anywhere else in North Carolina until additional clinical teaching facilities are developed.
2. The development of teaching services for interns and residents, in addition to eventually providing instruction for additional undergraduate

students will have immediate benefits by upgrading medical care and by attracting additional young physicians who may choose to enter practice in the area.

3. If and when additional teaching services are established in the state, including the Greenville area, the establishment of an additional four year medical school will become a feasible alternative to be compared with using such facilities to expand enrollment in existing schools which are now rate-limited in their expansion by the availability of clinical teaching services for medical students.

4. We do not believe that the present leadership at ECU, given the financial resources, has the experience or skill to plan for and to recruit the clinical faculty that will be needed to develop teaching services in the hospitals in the area and hence, we believe that responsibility for this development must be assigned elsewhere.

5. Finally, while we would attach the highest priority to efforts to develop clinical teaching capability in the Greenville area and

elsewhere in eastern North Carolina and, indeed, would urge such efforts, it is our judgement that the proposal to commit state resources to establish a new medical school at ECU is premature and is based upon a lack of understanding of what the establishment of such a school would involve.

VII. THE RECRUITMENT AND RETENTION OF ADDITIONAL
PRACTICING PHYSICIANS FOR NORTH CAROLINA.

In Section V-A-4, based upon present rates of retention of North Carolina medical school graduates and recruitment of graduates of medical schools outside the state, we projected the numbers of additional physicians that can be expected in North Carolina by 1980. Because there is a lag period of 7 years between entry into medical school and entry into practice, the size of the total national pool of new physicians for which North Carolina will be "competing" for the rest of the decade of the 1970s has already been determined with the entry of new medical school classes in the fall of 1973 since this year's entering class will be going into practice in 1980. Any further expansion of the production of new M.D.'s in the state or in the nation can be expected to yield results, in terms of additional practicing physicians, only after 1980. This led to the conclusion that any significant increase in physician manpower in North Carolina before 1980, beyond the numbers already projected must come from improved recruitment of individuals

already enrolled in medical schools or recently graduated M.D.'s and now completing residency training.

In Section V-B-2, an examination of educational factors that most influence the decision of physicians to enter practice in a state showed that the most significant single determinant of a state's total physician manpower is the total number of residency training places available within the state. A very important determinant of specific location within a state is the availability of continuing education opportunities for physicians in an area.

Later, in Section VI-B-2, the possibility of further expansion of the production of M.D.'s in the state was examined although the impact of such an expansion on total physician manpower would occur after 1980. It was shown that increases above those now projected by the three existing schools or by an additional school will be possible only if additional teaching facilities for the clinical instruction of more medical students can be developed within the hospitals of the state.

Thus, from the point of view of production of additional M.D.'s within the state and the

recruitment of additional physicians from outside the state, North Carolina has reached a point when it must give high priority to programs to expand the number of teaching hospitals for medical students and for residents.

Finally, on the basis of an assessment of other factors that tend to influence the location of physicians, particularly in rural settings, certain conclusions about specific mechanisms of recruitment can be drawn and programs to take advantage of this knowledge can be designed and implemented.

It is the purpose of this section to examine the mechanisms open to North Carolina to improve its "competitive" standing in the recruitment of practicing physicians, to increase its share of the nation's pool of physician manpower.

A. The Establishment of Additional Postgraduate
(Internship and Residency) Medical
Education Programs in North Carolina.

1. Present Status - The Report of the
Special Committee of the Board of Governors*

*op. cit., p. 31.

points out that in 1973-74, teaching hospitals in North Carolina will offer a total of 1165 internships and residencies out of a U.S. total of 68,689. Nationally, this amounts to 1.7% of all post-graduate training positions offered in North Carolina which has 2.5 per cent of the nation's population. Since 1967, there has been an increase of 12% (216 to 242) in the number of internships available in the state as shown in Table VII-A. This compares with a national increase of 11 per cent (13,644 to 15,232) in the same period. More important from the point of view of recruitment* are the numbers of residency positions offered, shown in Table VII-B. Since 1967, North Carolina residencies have increased by 41% (669 to 923) as compared with the national increase of 29% (40,786 to 52,711) during this same period.

Another encouraging aspect of North Carolina's position is that, despite the rapid expansion of residencies since 1967, 89 per cent of the state's positions were filled in 1971 as compared with the

*Scheffler, M., op. cit.

TABLE VII-A
NUMBER OF INTERNSHIPS OFFERED

	<u>1967</u>	<u>1969</u>	<u>1971</u>	<u>1973</u>
United States	13,644	14,705	15,257	15,232
South Atlantic Region	1,885	1,954	2,067	2,091
NORTH CAROLINA	216	221	215	242
Delaware	18	18	26	25
D. C.	278	279	351	354
Florida	343	340	314	331
Georgia	238	249	228	238
Maryland	374	389	479	453
South Carolina	88	106	103	99
Virginia	241	255	281	279
West Virginia	89	97	70	70
Other States				
Alabama	124	145	161	182
Kentucky	140	132	132	139
Minnesota	244	290	220	263
Mississippi	53	57	60	70
New Mexico	19	32	33	27
Tennessee	253	286	279	282
Texas	530	616	655	658
Vermont	14	38	30	24
Washington	145	187	147	143

Source:

JAMA, Nov. 25, 1968. 206(9).

JAMA, Nov. 20, 1972. 222(8).

TABLE VII-B
NUMBER OF RESIDENCIES OFFERED

	<u>1967</u>	<u>1969</u>	<u>1971</u>	<u>1973</u>
United States	40,786	43,401	49,198	52,711
South Atlantic Region	5,616	6,011	6,669	7,363
NORTH CAROLINA	669	754	840	923
Delaware	94	91	82	95
D. C.	1,011	1,045	1,204	1,331
Florida	842	912	1,079	1,172
Georgia	686	704	655	687
Maryland	1,173	1,250	1,333	1,489
South Carolina	236	263	356	406
Virginia	714	749	870	1,001
West Virginia	191	243	250	259
Other States				
Alabama	339	355	418	465
Kentucky	387	429	415	486
Minnesota	1,424	1,415	1,407	1,529
Mississippi	151	185	194	218
New Mexico	119	135	140	161
Tennessee	786	837	841	891
Texas	1,600	1,739	2,080	2,248
Vermont	101	123	116	114
Washington	488	539	561	585

Source:

JAMA, Nov. 25, 1968. 206(9).

JAMA, Nov. 20, 1972. 222(8).

U.S. mean of 85 per cent.* The state's record in this respect is particularly impressive since, in 1971, only 9 per cent of these positions were occupied by foreign medical graduates (FMGs) whereas, nationwide, 32 per cent of residents were FMGs in 1971.** This small number of FMGs in North Carolina programs is undoubtedly a direct result of the state's rather stringent licensing regulations for these individuals and contrasts with much higher numbers of FMGs found in residency programs of nearby states such as Virginia (19 per cent), Florida (26 per cent), and Georgia (41 per cent).*** If a decision were made to relax the licensing requirements for FMGs, the state could confidently expect an increase in demand for residency positions from this quarter.

The number of graduates from the three medical schools in North Carolina in 1971 was 220; this

*Directory of Approved Internships and Residencies, 1972-73, American Medical Association, Chicago, Ill.

**Ibid.

***Ibid.

will rise to 384 by 1980. In 1971, there were 93 North Carolinians who received M.D.s from the three state schools; this will rise to 232 by 1980.* It is estimated that the total number of U.S. medical school graduates will rise from 9,000 in 1971 to 15,000 in 1977.**

Taken together, it appears that the national need and demand for postgraduate training is going to increase strikingly and there is little likelihood that the establishment of additional residencies in North Carolina (provided the quality of education is maintained) would result in unused capacity.

It also appears that the stipends paid to North Carolina residents are competitive with those available elsewhere, hence, no immediate improvement in North Carolina's situation is likely from salary increases although, clearly, parity in this important area must be maintained in the future.

*See Table VI-C.

**Data from Association of American Medical Colleges.

2. Possibilities for Future Expansion of Residency Training in North Carolina. All of the foregoing information indicates that if an expansion of opportunities for postgraduate medical training came about, there is every reason to believe that the numbers of new medical graduates seeking such positions in the state would increase and, hence, the probability of increasing the number of practicing physicians in the state would be enhanced proportionately.

a. Hospital bed capacity - There are 138 acute general hospitals in the state of which 112 have fewer than 200 beds and 66 have less than 100 beds. Seven have more than 400 and 17 have more than 300 beds. Forty of 48 hospitals in eastern North Carolina and 25 of 26 hospitals in western North Carolina have less than 200 beds. Table VII-C shows the numbers of hospital beds by county and selected types of beds.

At present, internships offered in North Carolina are limited to Chapel Hill, Charlotte, Durham, Wilmington, and Winston-Salem.

There are 30 residencies in family medicine at Chapel Hill, Greensboro, and Charlotte. There

NUMBERS OF HOSPITAL BEDS BY COUNTY AND SELECTED TYPES OF BEDS

TABLE VII-C

242

County	Total	Medical- Surgical	Obstetrical	Pediatric	Psychiatric	Rehabilitation	Special Care ^x
Alamance	254	210	37				7
Alexander	31	28	3				3
Alleghany	47	40	4				46
Anson	93	37	10				4
Ashe	76	65	7				
Avery	153	123	23	2			5
Beaufort	214	166	35	4			9
Bertie	50	50					
Bladen	60	52	8				
Brunswick	418	336	25	30	13		14
Buncombe	1144	646	66	48		74	310
Burke	494	419	36	24			15
Cabarrus	492	405	23	32			32
Caldwell	162	129	22	10			1
Camden							
Carteret	170	141	19				10
Caswell							
Catawba	449	368	50		15		16
Chatham	99	89	6				4
Cherokee	87	76	6	2			3
Chowan							
Clay	116	48	6	3			59
Cleveland	439	348	43	39			9
Columbus	142	101	22	15			4
Craven	186	114	21	20	25		6
Cumberland	457	302	70	36	31		18
Currituck							
Dare							
Davidson	256	203	25	17			11
Davie	62	52	4				6

TABLE VII-C - con't (1)
NUMBERS OF HOSPITAL BEDS BY COUNTY AND SELECTED TYPES OF BEDS

243

County	Total	Medical-Surgical	Obstetrical	Pediatric	Psychiatric	Rehabilitation	Special Care
Duplin	80	66	8	5	1		
Durham	1835	1420	82	98	65	75	95
Edgecombe	150	87	21	23	13		6
Forsyth	1559	1052	138	106	34	58	171
Franklin	80	72	6				2
Gaston	2058	623	18	507	901	2	7
Gates							
Graham							
Granville	184	157	14	4			9
Greene							
Guilford	1240	915	117	106	22		80
Halifax	294	282			6		6
Harnett	175	153	16	4			2
Haywood	161	127	10	14	2		8
Henderson	304	268	19	11			6
Hertford	159	132	16	11			
Hoke	337	114					223
Hyde							
Iredell	495	421	45	27			2
Jackson	80	60	10	5	2		3
Johnston	160	123	16	16			5
Jones							
Lee	142	106	20	8			8
Lenoir	458	415	29	12			2
Lincoln	200	164	16	20			
Macon	72	68		2			2
Madison							
Martin	110	93	7	10			
McDowell	54	40	10	2			2
Mecklenburg	2052	1467	142	123	61	57	202
Mitchell	50	46	2				2
Montgomery	83	74	9				
Moore	75	50					25
Nash	680	516	66	44	20		34
New Hanover	169	80	12	70			7

TABLE VII-C - con't (2)

County	Total	Medical- Surgical	Obstetrical	Pediatric	Psychiatric	Rehabilitation	Special Care
Northampton							
Onslow	245	214	22	5			4
Orange	765	498	20	73	63	13	98
Pamlico							
Pasquotank	152	132	10	4			6
Pender	47	39	6				2
Perquimans							
Person	90	47	16				27
Pitt	218	143	26	26	6		17
Polk	125	110	11	3			1
Randolph	165	92	31	16			26
Richmond	192	149	27	12			4
Robeson	387	222	30	22	23		90
Rockingham	271	222	26	10			13
Rowan	337	238	31	59			9
Rutherford	190	162	18	2			8
Sampson	178	155	12	5			6
Scotland	170	119	18	28			5
Stanly	133	82	27	10			14
Stokes	28	28					
Surry	260	229	24				7
Swain	51	46	4				1
Transylvania	143	97	4	2			40
Tyrrell	32	30					2
Union	195	103	26				66
Vance	100	76	20				4,
Wake	1033	794	74	61	30		74
Warren	37	33	4				
Washington							
Watauga	183	96	15	4			68
Wayne	605	342	50	30	82	84	17
Wilkes	140	105	16	12			7
Wilson	699	588	19	28	23		41
Yadkin	70	52	9	5			4
Yancey	33	31	2				

TABLE VII-C - con't (3)
NUMBERS OF HOSPITAL BEDS BY COUNTY AND SELECTED TYPES OF BEDS

245

Source: Medical Care Commission licensing data, fiscal year 1971.

* Special care units include alcoholic, ambulatory or self-care, coronary care, extended care, intensive care, special care-burn, special care-pediatric, special care-pulmonary, and special care-other.

are 90 residencies in internal medicine at Chapel Hill, Charlotte, Durham, and Winston-Salem. There are 59 residencies in Obstetrics-Gynecology at Chapel Hill, Charlotte, Durham, Wilmington, and Winston-Salem. There are 50 pediatric residencies at Chapel Hill, Charlotte, Durham, and Winston-Salem.

There exist many opportunities to expand post-graduate training in North Carolina hospitals where, until now, no such educational programs exist. We will cite only some illustrative examples:

(1) Fayetteville - There are 1509 acute care medical beds in the Womack (U.S. Army), U.S. Veterans, Cape Fear, and Highsmith-Rainey Memorial Hospitals. These hospitals admit more than 37,000 patients yearly, see 156,000 outpatients, and perform more than 17,000 surgical operations yearly. The four hospitals are located within a 5 mile radius and 2 have helicopter pads. These combined facilities, with adequate supervision and an affiliation with one of the state's medical schools could provide a substantial increase in the teaching of medical students and the training of interns and

residents in community hospitals.*

(2) Asheville - The Memorial Mission and St. Joseph's Hospitals, consisting of 602 beds, are well-staffed institutions that carry out more than 17,000 surgical procedures annually, including open-heart surgery, care for more than 40,000 emergency room patients annually, admit 900 patients to an adult intensive care unit, carried out about 1000 renal dialysis (artificial kidney) procedures last year, and have just installed a new pediatric intensive care unit. A contract affiliation with UNCCH for joint educational programs was signed within the past month and, clearly, the potential for increasing the state's medical educational capacity in this western area is very great,**

*Information supplied to the Panel by Dr. William B. Hall, Jr. Dr. Hall has also informed us (Aug. 27, 1973) that direct discussions are now underway with UNCCH about the possibility of the cooperative development of residency training (see Section VII-B on Area Health Education Centers).

**Information supplied to the Panel by a group headed by Mr. William E. Highsmith.

b. Charlotte Memorial Hospital:

An Example of What Can be Done. Ten years ago, this hospital had no interns and only 18 residents. In September, 1962, it was decided to place major emphasis on medical education. In 1972-73, the hospital had 18 interns, seven dental interns and 50 residents, including 25 in primary care specialties, representing 26 different U.S. medical schools, 3 dental schools, and 4 foreign medical schools. For many years, it was the deliberate policy to give preference to graduates from out-of-state medical schools (this has now been modified). There are now 62 physicians who received residency training in this program practicing in North Carolina. Thirty-four of these have remained in Charlotte; the others are in Winston-Salem (2), Rutherfordton, Gastonia (3), Greensboro, Valdese, Asheville (2), Clinton, Kinston, Edenton, Fayetteville, Smithfield, Wadesboro, Brevard, Pollocksville, Boone, Hendersonville, Asheboro (2), Rocky Mount, Matthews, Shelby, Grover (2), and West Jefferson.*

The hospital has become affiliated with UNCCH and medical students from Chapel Hill rotate through

*Information supplied to the Panel by Dr. Bryant L. Galusha.

its services regularly as clinical clerks.

This is a striking illustration of the contribution that postgraduate education can make and has made to the physician manpower of North Carolina.

c. Influence of Postgraduate Education upon Location of Physicians in North Carolina. The specific experience of Charlotte Memorial Hospital can be generalized from inspection of data collected in a study tracing the careers of graduates of the medical school at UNCCH. Table VII-D summarizes the striking relationship between location of residency training and location of practice. It is this constant finding in national studies and in North Carolina specifically that leads us to the opinion that the state should give highest priority to postgraduate training as a mechanism for expansion of the number of practicing physicians in North Carolina.

B. Area Health Education Centers (AHEC). The continuing increase in the number of residencies offered in North Carolina hospitals since 1967 is, for the most part, the result of a process that began years ago as the state's three medical schools

TABLE VII-D
PRESENT LOCATION OF UNCCH MEDICAL GRADUATES (IN-STATE/OUT-OF-STATE),
BY PLACE OF RESIDENCIES

PLACE OF RESIDENCIES	Grouped Classes of:						TOTAL	
	1954-57		1958-61		1962-65			
	NC	OUT	NC	OUT	NC	OUT	NC	OUT
2 RESIDENCIES, BOTH N.C.	10	1	9	4	5	-	24	5
1 RESIDENCY, N.C.	40	15	38	16	33	7	111	38
1st RES. N.C., 2nd OUT	6	5	6	2	1	-	13	7
1st RES. OUT, 2nd N.C.	15	1	15	-	1	-	31	1
1 RESIDENCY, OUT	35	23	24	64	8	69	67	156
2 RESIDENCIES, OUT	8	17	7	22	-	5	15	44
NO RESIDENCY	33	5	27	9	22	83	82	97
TOTAL BY PRESENT LOCATION	147	67	126	117	70	164	343	348

from time-to-time, sought affiliations with community hospitals to provide additional and more varied clinical education for medical students or for residents based in the academic centers. There is now underway a major, much better organized and innovative collaborative effort under the leadership of the School of Medicine at UNCCH. This involves the concept of the Area Health Education Center (AHEC), the central purpose of which is to bring about a better distribution of health manpower, especially in rural areas, emphasizing accessibility and availability of primary care services.

1. History of AHEC in North Carolina - Beginning in 1967, UNCCH School of Medicine established affiliations with several community hospitals and in 1969 the General Assembly appropriated funds for the establishment of undergraduate and postgraduate educational programs in these institutions. By the time that Congress enacted the Comprehensive Health Manpower Training Act in 1971, UNCCH had 16 fulltime faculty members located in 7 affiliated hospitals throughout the state and was in an excellent position, by virtue of this initial

experience, to compete for federal funds appropriated to establish a system of AHECs. UNCCH was awarded NIH Contract No. 72-4387 by the Bureau of Health Manpower in the amount of \$8.5 millions over a five year period in a keen national competition. After less than a year of the contract, AHECs have been established in:

- Charlotte (Charlotte Memorial Hospital)
- Wilmington (New Hanover Memorial Hospital)
- Raleigh (Wake Memorial Hospital)
- Asheville (Memorial Mission and St. Joseph's Hospitals)
- Planning area L in eastern North Carolina, including Rocky Mount (Nash General Hospital), Tarboro (Edgecombe General Hospital), Roanoke Rapids (Halifax Memorial Hospital), and Wilson (Wilson Memorial Hospital).

These 5 AHECs will be supporting and training health personnel in 31 counties. AHEC funds are limited to education and training; there are currently no funds to develop and operate rural medical service programs.

Four additional AHECs are under discussion or are in the negotiation stage:

- Northwestern North Carolina
- Greensboro (Cone Memorial Hospital)

--Fayetteville (4 hospitals)

--Greenville (Pitt County Hospital)

2. Functions of AHEC. The development of AHEC involved a close working relationship between UNCCH, the practicing professionals in the area, and the hospital board of trustees representing the community. The following programs fall within the function of AHEC.

--The education of medical students, interns and residents.

--Continuing education for physicians with emphasis on primary care physicians.

--Undergraduate and continuing education of other health professionals.

--Regional training of family nurse practitioners.

--Provision of health manpower support to smaller community hospitals in the area.

3. Accomplishments of AHEC in North Carolina. During the past year, the AHEC programs have compiled a solid record of achievement. They have:

--Strengthened family practice residencies in Greensboro and arranged for family practice residents in Chapel Hill to receive part of their training in Rocky Mount.

--Established internal medicine and pediatric residencies in Greensboro and internal medicine residencies in Wilmington.

--Planned and will implement in 1974 training programs for family nurse practitioners in Wilmington and Area L.

--Established an associate degree nursing program in eastern North Carolina.

--Planned and will implement in 1974 training of nurse anesthetists in Wilmington.

--Provided more than 500 days of consultation by UNCCH faculty.

--Expanded public health nursing training in maternal and infant care for several counties in the Charlotte area and planned to do so in the Wilmington area.

--Provided direct service to nearly 8,000 patients in 11 areas of the state.

--Provided, in community hospitals, more than 10 per cent of all the clinical training for 3rd and 4th year medical students at UNCCH.

--Participated in development of an approved residency in Family Practice in Charlotte.

--Recruited 22 physicians into the Wilmington area including 15 in primary care fields.

This is a most impressive demonstration of what has already been done. The potential for the future is bright.

4. Future Possibilities of AHEC. In terms of ameliorating the specific problem of physician manpower, the AHEC organization and program

can contribute enormously to emphasizing those incentives known to influence the eventual location of physicians in practice:

--They provide medical students with a part of their clinical training in smaller communities, giving earlier experience in that environment.

--They can greatly expand the number of residency places for primary care in the state.

--They can greatly enhance the professional environment for practicing physicians by providing consultants and referral services, colleagues with whom to share professional duties, and programs of continuing education.

All of these objectives can be accomplished in an organized, integrated fashion under the AHEC programs.

Additionally they can assure an adequate supply of nurses, laboratory and x-ray technicians, family nurse practitioners, pharmacists, etc. in the area.

Finally, the base hospitals, as they make available the smaller hospitals in each region their back-up and consulting services and assure that health manpower will be locally available can serve as major nodes in a statewide network. With primary care clinics at the periphery to assure accessibility to care in even the most rural regions,

there will be back-up by physicians and nearby hospitals and, where necessary, clear lines of referral and access of patients to these major regional centers, supported by state and local funds.

5. Building on the AHEC Concept. While UNCCH has taken the lead, because of the availability of Federal funding, in beginning the organization of education in the state under the comprehensive concept of AHECs, it is clear that acceleration of this process will require additional state funding and the development of a mechanism that will enable the two private medical schools in the state to share the burden of the development of these regional centers using their expertise and educational resources in an organized fashion, integrated into a statewide effort.

The benefits in terms of problems of physician manpower and accessibility of medical care that will accrue from accelerating and expanding AHEC are such that we believe that it would be a mistake to allow the initial level of federal funding to pace the progress of the program and we therefore urge an early expansion of state support.

We are unable to present a detailed plan (nor,

incidentally, is it our role to do so) for accomplishing the extension of AHEC statewide but we would urge that such a plan be prepared and that funding be requested.

We believe that such a plan should provide, at a minimum, for the following elements:

a. Capital costs - The present hospital system is constrained by county lines. It is inevitable that many of the base hospitals for AHEC will come to serve the region, indeed, many have been chosen because they attract patients from surrounding counties. These institutions and their local tax payers cannot be expected to pay for facilities needed primarily for out-of-county patients or for educating health personnel. State funds should fill this gap. Similarly, office space and educational space such as conference rooms and libraries required for full-time physicians and other professional personnel who are present primarily as regional educators should be paid for by state funds.

b. Operating Costs. There are several items of recurring cost that will be highly dependent upon the availability of state funds:

(1) Stipends for residents -

Despite all that has been said about expanding residency programs, without additional funding which can come only from the state, residency positions may actually become fewer. Stipends for residents have been the responsibility of hospitals and, because of the stringent cost controls now being applied to hospitals it is unrealistic to believe that they can increase their educational costs substantially. While the institutions should share in the costs of residency training on some agreed-on formula basis, it is clear that the state will have to supply money if the program is to go forward. Since we believe that there should be provision for 250-300 additional primary care residencies in the state as soon as possible, substantial funding will be required.

(2) Support for fulltime educational staff. State sharing of the expenses of faculty and other instructors in the local institutions will be needed as it will for residents.

(3) Educational expenses. These might include books and professional journals, visual aids, stipends for visiting lectures, etc.

(4) Student Support. It is unrealistic to plan for the education of increasing numbers of medical and other health professional students at off-campus sites without providing for the costs of transportation (or a means of transportation) and particularly for housing in the community. Many students are married and this will complicate the housing logistics. On the other hand, the spouse should be encouraged to accompany the student (or residents) to a community if the rotation is for an appreciable period since this will offer an opportunity to "test the environment" and, perhaps, enhance the prospects of later recruitment into practice.

As rough estimates of what might be required to accomplish a program that would create 300 new residencies in primary care, we would guess \$20 to \$25 million in capital expenditures in hospitals throughout the state, \$1 million for residency stipends in the first year, rising to \$3 millions in the third year, \$2 millions for educational personnel, and \$500,000 for travel and housing. These are "ballpark" figures and are suggested only to give some idea of the general magnitude of the funds that will be required.

C. Other Measures for Recruitment.

1. Foreign Medical Graduates. As has been mentioned, there are relatively few FMGs practicing in North Carolina. Table VII-E compares the annual licensure of FMGs in North Carolina with the U.S., the region and certain other states.

In 1970, FMGs accounted for 17.1% of the physicians in the United States. The State of New York had the highest percentage of foreign medical

TABLE VII-E
 LICENSES ISSUED & NUMBER OF FOREIGN
 MEDICAL GRADUATE (FMG) ADDITIONS TO MEDICAL PROFESSION

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	<u>1961</u>		<u>1968</u>		<u>1972</u>	
	Total	FMG	Total	FMG	Total	FMG
United States	16,974	1,467	21,629	2,065	33,205	6,546
South Atlantic Region	2,658	295	3,706	390	6,863	1,248
NORTH CAROLINA	308	0	395	9	628	27
Delaware	36	3	37	2	106	49
D. C.	226	13	380	55	768	104
Florida	563	13	699	59	1,623	254
Georgia	331	6	437	17	881	109
Maryland	446	51	891	163	953	115
South Carolina	109	0	155	1	300	0
Virginia	529	205	620	81	1,353	530
West Virginia	110	4	92	3	251	60
Other States						
Alabama	145	0	196	0	314	1
Kentucky	198	81	396	20	447	34
Minnesota	235	15	469	28	177*	0*
Mississippi	151	19	185	15	239	4
New Mexico	78	3	196	7	255	25
Tennessee	297	1	275	2	476	44
Texas	555	14	814	85	1,120	71
Vermont	56	3	229	101	353	176
Washington	234	17	469	53	560	46

Source:

JAMA, June 16, 1969. 208(11).

JAMA, June 9, 1962. 180(10).

JAMA, July 16, 1973. 225(3).

* Incomplete report.

graduates, 35.6%, while the State of Arkansas had the lowest number of FMGs, 1.3%. Only 12 states had a lower percentage of FMGs than North Carolina.

Those states include:

Alabama	Nevada
Arkansas	Oklahoma
Idaho	Oregon
Mississippi	South Carolina
Montana	Utah
Nebraska	Wyoming

In 1970, North Carolina had 6,069 physicians of which 5,696 obtained their medical education in the United States. Foreign medical graduates accounted for 311 of the physicians and the remaining 62 received their basic education in Canada. The Canadian graduates accounted for 1.0% of the physicians in the State of North Carolina.

In states with large percentages of FMGs, the physician/population ratio is significantly affected by their presence. For example, in New York State there are 245 physicians per 100,000 residents when all physicians are taken into account. When Canadian and other FMGs are excluded, the ratio drops by almost 100 physicians per 100,000 population.*

*Haug, J.N. & Martin, B.C., Foreign Medical Graduates in the United States, 1970, American Medical Association, Chicago, 1971.

The major sources of the foreign medical graduates for North Carolina are listed below:

United Kingdom	34
West Germany	25
Philippines	22
India	21
Cuba	16
South Korea	12
Mexico	12
Netherlands	10
Italy	10

The remaining foreign medical graduates come from 45 different countries, each of which supplies less than 10 physicians to the state. Table VII-F is a breakdown of all FMGs in North Carolina and also shows the type of practice in which they are engaged.

There are many who deplore the fact that the U.S. has become "dependent" upon physicians trained in developing countries where they are needed far more than in the affluent U.S. For example:

"The money the governments of underdeveloped nations have spent and are spending to train doctors who then leave for the U.S. amounts to billions of dollars' worth of foreign aid in reverse. Unintentionally given by those who can least afford it, it is resented even more intensely than assistance provided by the 'haves' to the 'have nots.'"

*Randal, J., Washington Close-up: Foreign Medical Graduates, Washington Evening Star News, June 21, 1973.

TABLE VII-F
BREAKDOWN BY COUNTY OF ORIGIN AND TYPE
OF PRACTICE OF N.C. FMGs

MAJOR PROFESSIONAL ACTIVITY											
STATE COUNTRY	TOTAL PHYSICIANS	TOTAL	PATIENT CARE			OTHER PROFESSIONAL ACTIVITY				Not Classified	Inactive
			OFFICE BASED PRACTICE	HOSPITAL BASED		Medical Teaching	Adminis- tration	Research	Other		
				Interns and Residents	Full-Time Physician Staff						
NORTH CAROLINA											
TOTAL	311	222	69	77	76	5	16	54	1	1	12
ARGENTINA	4	1		1				2			1
AUSTRALIA	3	2		2			1				
AUSTRIA	5	3	2		1						
BELGIUM	3	2	1	1				1			2
BRAZIL	3	3			2						
BULGARIA	1	1		1	1						
BURMA	1	1			1						
CHILE	2	2		2							
COLOMBIA	5	4	1	2	1		1				
CUBA	16	15	7	2	6	1					
CZECHOSLOVAKIA	1	1	1								
DENMARK	1	1	1								
DOMINICAN REPUBLIC	2	2		1	1						
EAST GERMANY	6	3	2	1				3			
ECUADOR	1	1			1						
EL SALVADOR	2							2			
FINLAND	1	1	1								
FRANCE	2	2	2								
GREECE	3	2	2			1					
GUATEMALA	2	1		1				1			
HONG KONG	1	1			1						
HUNGARY	5	3	1		2	1					1
ICELAND	1							1			
INDIA	21	18	2	9	7			3			
INDONESIA	1	1		1							
IRAN	8	6		2	4			1			1
IRAQ	3	3	1	1	1						
IRELAND	5	3	2		1		1				1
ISRAEL	1							1			
ITALY	10	7	1		6			3			
JAPAN	8	4		1	3			4			
LEBANON	9	7	4	1	2		2				
MEXICO	12	8	2	3	3	1	1	2			
NETHERLANDS	10	6	5		1			4			
NEW ZEALAND	1	1			1						
NORWAY	1	1	1								
PAKISTAN	3	3		3							
PERU	2	2	1	1							
PHILIPPINES	22	18	6	7	5		1	3			
SINGAPORE	3	3		2	1						
SOUTH AFRICA	3	1	1				1	1			
SOUTH KOREA	12	10	1	5	4						2
SPAIN	7	6		3	3		1				
SWEDEN	1							1			
SWITZERLAND	6	2	1		1		1	2	1		
SYRIA	1							1			
TAIWAN (FORMOSA)	10	6		4	2			3		1	
THAILAND	7	7		6	1						
TURKEY	2	2		1	1						
UNION OF SOVIET SOCIALIST REPUBLICS	4	3	2		1						1
UNITED ARAB REPUBLIC (EGYPT)	6	5	1	3	1			1			
UNITED KINGDOM	34	17	8	5	4	1	6	8			2
URUGUAY	1							1			
WEST GERMANY	25	19	9	3	7			5			1
YUGOSLAVIA	1	1		1							

Source: Foreign Medical Graduates in the United States, 1970

Reference is also heard to the immorality of our "importation" of physicians from abroad. In actual fact, of course, the U.S. does not import physicians. They immigrate to this country voluntarily and are admitted under our Immigration and Nationality Act. Many of those who come here for training decide to stay, of course, but under PL 91-225, if the Secretary of State determines that their skills are needed at home or they have trained here under a program financed by their government or ours, they must return to their country of origin for a two year waiting period before applying for re-entry to the U.S.* There is every indication that many will continue to decide voluntarily to come and practice in the U.S. The future pattern of this immigration will depend upon the position of foreign nations with regard to the outflow of their own physicians and the individual FMG's perceptions regarding the financial and social incentives of practicing medicine in the U.S. rather than his own country.

*Datagram: The Dependence upon Foreign Trained M.D.'s in Our Medical Care System, Journal of Medical Education, Vol. 47, pp. 496-498, June, 1972.

Many states have decided deliberately to utilize these FMGs to strengthen physician manpower. North Carolina, as noted, has made no such decision (except for the staffing of state mental hospitals). The actual situation* concerning licensure of FMGs in North Carolina indicates that the major hurdle to licensure is the requirement of the State Board of Medical Examiners for U.S. citizenship to be considered for an unrestricted (geographically) license to practice in the state. Should an applicant hold an alien registration receipt card and meet professional requirements, the Board may grant a license with geographic limitation, usually quite narrow, such as the county in which he resides. Since naturalization takes six years, such a license is issued for a period of six years after which time, the applicant, if naturalized, can have it converted into a regular, unlimited license. If an FMG has not become naturalized after six years, the license is generally

*Information supplied by Dr. Joseph J. Combs, Executive Secretary of the Board of Medical Examiners of North Carolina.

not renewed. Professional qualifications required by the Board include passing the Educational Council for Foreign Medical Graduates (ECFMG) examination as well as the standard medical examination for licensure in the State of North Carolina. Clearly, FMGs have not found these regulations conducive to settling in North Carolina to practice. We believe that relaxation of the stringent regulations concerning U.S. citizenship (which has nothing to do with lowering professional qualifications) would substantially augment the physician manpower of the state.* It is an alternative well worth serious consideration by North Carolina.

*For further, detailed discussions of this "problem," see:

Knobel, R.J.: Placement of Foreign-trained Physicians in U.S. Medical Residencies, Medical Care, Vol. 11, pp. 224-239, 1973.

Grubel, H. and Scott, A., The International Flow of Human Capital, American Economic Review, Vol. 56, p. 268, 1966.

Margulies, H. and Block, L. (editors), Foreign Medical Graduates in the United States, Harvard Univ. Press, Cambridge, 1969.

2. A Systematic Program for Recruiting Physicians to North Carolina. In 1971, the Division of Education and Research in Community Medical Care of the School of Medicine at UNCCH contacted the directors of a number of teaching hospitals in the southeastern U.S., requesting the names and home addresses of interns and residents in their institutions. The response was excellent and some 300 names and addresses of young M.D.'s training in areas close to North Carolina were received.

On the basis of this initial response similar requests were sent out this year to all hospitals in the southeast listed in the Director of Internships and Residencies of the American Medical Association. As a result, the names of 3500 residents were collected. In September, a personal letter will be sent to each young physician inviting his interest in exploring practice opportunities in North Carolina. Several practicing physicians and community leaders from the state have already agreed to visit those residents who express an interest during October and, in November and December it is expected that those residents who indicate a further

interest will begin to visit the state (with their spouses) in November and December, the time at which residents in their last year of training begin to make firm decisions about practice locations. Apparently, Secretary of Human Resources David Flaherty has indicated interest and offered financial support for this effort which will remain with the School of Medicine, UNCCH for this year. If appropriate staffing can be arranged the Office of the Secretary will take it over next year and expand the effort to include not only the communities but the state hospital system as well.

We believe that a continuing systematic, personalized system of recruiting of this type, drawing on a very large pool of young physicians who are on the verge of entering practice is an excellent investment of state funds and we would support its continued development and implementation. An expenditure of \$100,000 or so annually on this type of program, if it resulted in the recruitment of even 50 to 100 physicians into the state each year (this would be a "success rate" of only 1.5 to 3.0 per cent) would be cost-effective in that the cost of recruitment would be only \$1,000-\$2,000 per physician.

In summary, there is an excellent opportunity for North Carolina to recruit additional practicing physicians into the state within the immediate future. The highest yield is likely to come from the establishment of additional programs of primary care residency training in the several hospitals throughout the state that are capable of sustaining such programs. Not only will these postgraduate educational programs enhance immigration of young physicians into the state and improve the quality of medical care immediately but the creation of teaching hospitals will eventually provide additional facilities to the medical schools of the state for the clinical instruction of medical students. This latter would eliminate the most serious obstacle to any further expansion of undergraduate medical education in North Carolina. The AHEC program offers a firm base upon which to build these new educational programs and to develop them as part of a statewide, integrated program of professional training and improved care, carried out on a regional basis, with primary care clinics providing access at the farthest reaches and successive back-up services finally centering in a base hospital for each region.

Other and additional recruitment opportunities include measures to attract more FMGs into practice in North Carolina without compromising present standards of professional qualification and the establishment of an organized program of recruitment of young physicians as they complete their postgraduate residency training in nearby regions outside of North Carolina.

We believe that all three approaches offer complementary ways of making a major impact upon North Carolina's effort to increase the number of physicians who make a decision to settle and to practice in the state.

APPENDIX A

ALPHABETICAL LISTING OF PERSONS WITH WHOM THE
PANEL OF MEDICAL CONSULTANTS MET IN THE
CONDUCT OF THIS STUDY

Note: Multiple meetings are noted in
parentheses following individual's
name.

Senator Gordon P. Allen

Mr. Jack Allison
(from State Planning Office)

Dr. William G. Anlyan
Vice President for Health Affairs, Duke University

Dr. Apple
Faculty, North Carolina State University

Dr. Armstrong
Faculty, North Carolina State University

Representative S. Gerald Arnold

Mr. Robert Bass
Second Year Medical Student
University of North Carolina

Mrs. Joanne Bell
Head, Medical Library, East Carolina University

Mr. James Bernstein
Chief, Rural Health Services
State of North Carolina

Dr. Andrew A. Best
East Carolina University Board of Trustees (2 meetings)

Mr. W. Earl Britt
Vice Chairman, University of North Carolina
Board of Governors

Chancellor John T. Caldwell
North Carolina State University, Raleigh

Mr. Charles Clark
Vice President, Fayetteville Chamber of Commerce

Mr. John M. Danielson
General Director, North Carolina Memorial Hospital

Dr. Raymond Dawson
Vice President for Academic Affairs
University of North Carolina System

Senator Charles B. Deane, Jr.

Dr. George Debnam
Old North State Medical Society

Mr. William A. Dees, Jr.
Chairman, University of North Carolina Board of
Governors

Dr. Hubert Eaton
Old North State Medical Society

Mr. William Flowers
Mayor, Plymouth, North Carolina

Dr. Christopher Fordham, III.
Dean, University of North Carolina School of Medicine
(3 meetings)

President William Friday
University of North Carolina System (2 meetings)

Dr. Bryant Galusha
Director of Medical Education and AHEC
Charlotte Memorial Hospital

Dr. John Gamble
Member, North Carolina House of Representatives

Dr. George Gilbert
President, North Carolina Medical Society

Dr. John Glasson
Past President, North Carolina Medical Society

Dr. E. W. Glazener
Faculty, North Carolina State University

Dr. Bernard G. Greenberg
Dean, School of Public Health
University of North Carolina

Dr. William B. Hall, Jr.
Chairman, Cumberland County Health Care Committee

Dr. Harkimer
Faculty, North Carolina State University

Senator Joseph J. Harrington

Representative W. S. Harris, Jr.

Dr. Hayek
Chairman, Admissions Committee for the Medical School
East Carolina University

Senator John Henley

Chancellor William E. Highsmith
University of North Carolina at Asheville

Governor James Holshouser

Dr. Holt
Vice Chancellor, East Carolina University

Senator Hamilton C. Horton, Jr.

Lieutenant Governor James B. Hunt, Jr.

Dr. John J. Hunt
North Carolina House of Representatives

Representative J. P. Huskins

Dr. Leo Jenkins
Chancellor, East Carolina University

Mr. Ralph Jennings
Memorial Hospital, Asheville

Representative Roberts H. Jernigan, Jr.

Mr. Elmer Johnson
Assistant State Planning Officer, Comprehensive Health

Dr. Charles Johnson
President, The Old North State Medical Society

Robert B. Jordan, III.
University of North Carolina Board of Governors

Senator Russell Kirby

Senator H. Edward Knox

Mrs. Linda Mashburn
Director, Hot Springs Health Program

Dr. Maxton Mauney
Asheville Hospitals

Dr. John McLeod
Asheville Area

Colonel McSwane
Executive Officer, Womack Army Hospital

Dr. Manson Meads
Vice President for Medical Affairs
Wake Forest University

Dr. Arden Miller
Professor of Maternal and Child Health
School of Public Health, University of North Carolina

Senator William D. Mills

Dr. Edwin Monroe
Vice Chancellor for Health Affairs
East Carolina University (3 meetings)

Senator Herman A. Moore

The Honorable Robert Morgan
Attorney General, State of North Carolina

Dr. Charles Morron
Provost, University of North Carolina, Chapel Hill

Mr. Moss
Hospital Administrator

Dr. Dale Newton
Intern, North Carolina Memorial Hospital

Dr. Perry
Dean, School of Nursing, East Carolina University

Representative Charles W. Phillips

Representative Liston B. Ramsey

Speaker James E. Ramsey

Representative H. Horton Rountree

Miss Donna Schafer
Family Nurse Practitioner, Walstonburg Community
Health Program

Dr. Schweisthal
Head, Department of Anatomy, East Carolina University

Senator Ralph H. Scott

Mr. Ronald F. Scott
State Planning Officer

Dr. Cecil Sheps
Vice Chancellor for Health Affairs
University of North Carolina, Chapel Hill

Mr. Harvey Smith
Professor and Director, Social Research Section
University of North Carolina

Representative Carl J. Stewart, Jr.

Mr. Van Stitt
Third Year Medical Student, University of North Carolina

Senator Thomas E. Strickland
Chairman, Committee on Higher Education

Mr. David Tart
Fourth Year Medical Student, University of North Carolina

Chancellor N. Ferebee Taylor
University of North Carolina, Chapel Hill (2 meetings)

Dr. Thiele
Dean, School of Allied Health and Social Professions
East Carolina University

Mr. John Uribe
Second Year Medical Student, University of North Carolina
(First year at East Carolina University)

Mr. Ed Warren
Member, Pitt County Hospital Board

Senator Wesley D. Webster

Senator Vernon E. White

Dr. Jack Wilkerson
Greenville Area

Mr. Glenn Wilson
Associate Dean, University of North Carolina
School of Medicine

Dr. Wallace Wooles
Dean, School of Medicine, East Carolina University
(3 meetings)

APPENDIX B

DOCUMENTS AND COMMUNICATIONS
RECEIVED AND UTILIZED BY
THE PANEL OF MEDICAL CONSULTANTS

Association of American Medical Colleges. "The Advisor", Vol. 9, No. 2, May 1973. Washington: The Association, 1973.

Association of American Medical Colleges, Private communication from Jesse L. Darnell, Assistant Director, Data Processing, regarding MCAT Scores, August 1973.

American Medical Association. "Medical Licensure 1972", JAMA, July 16, 1973, Vol. 225, No. 3.

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